The role of PTSD, guilt and shame in predicting moral injury in veterans that have experienced active deployment.

Vicky Aldridge

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Declaration and signature of candidate
I confirm that the thesis submitted is the outcome of work that I have undertaken during my programme of study, and except where explicitly stated, it is all my own work. I confirm that the decision to submit this thesis is my own. I confirm that except where explicitly stated, the work has not been submitted for another academic award. I confirm that the work has been conducted ethically and that I have maintained the anonymity of research participants at all times within the thesis. Signed: Date: 26.04.2018

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Abstract

Paper one is a literature review of ten empirical studies. It reviews what is known about the relationship between killing in combat and PTSD, exploring the question within a military and veteran population. The findings highlighted that those who kill in combat are more likely to report greater severity of PTSD symptoms, although there is some disparity. Other factors, such as victim characteristics and gender, may influence this relationship. Some of the studies were limited by lack of a representative sample and generalisability. There were also issues with transparency, which limits the reliability of some of the conclusions made.

Paper two is an empirical study. This was internet-mediated research which explored the relationship between PTSD, guilt, shame and moral injury in a British veteran population. 104 participants took part in the study. A standard multiple regression analysis was conducted on the data. Findings indicated a significant relationship between PTSD and moral injury. The results did not support the hypothesis that guilt and shame would predict moral injury. The findings are discussed, along with their clinical implications, limitations and direction for future research.

Paper three is an executive summary. This has been written as an accessible document intended for dissemination of the findings of the empirical study to a veteran and general population. The research method, findings and clinical implications have been summarised within this report.

Post-Traumatic Stress Disorder and Killing in Military Combat: A review of existing literature on serving military and veteran populations.

This paper has broadly been prepared in accordance with the requirements of the British Journal of Psychology.
Author Guidelines are listed in Appendix A.

Word Count: 7,954

Abstract

Objective: This review provides a systematic search of the existing literature on post-traumatic stress disorder (PTSD) and killing in military combat. In particular it summarises what is known about the relationship between these variables, specifically whether PTSD is more prevalent in individuals whom have killed in combat. For this purpose it focuses on a military and veteran population.

Method: A literature search was conducted in a systematic manner using a number of databases. Additional studies were hand searched from reference sections of identified studies and related articles. Unpublished theses were searched through an online database to reduce publication bias.

Results: Ten papers met the inclusion criteria for this review. All of the papers used a quantitative method of analysis and reported on the relationship between PTSD symptoms and killing in combat. All met a reasonable level of quality as assessed through a critical appraisal tool developed by the author.

Conclusions: Those who kill during combat are more likely to report symptoms of PTSD. Disparity exists as to the statistical significance of this relationship. Factors such as gender and victim characteristics may also influence this relationship. The impact of killing during combat must be considered when working therapeutically with a military and veteran population. Future research should aim to recruit military participants from different populations. Researchers should aim to address some of the difficulties with recruitment; ensuring samples are representative and generalisable.

Introduction

This literature review considers what is known about the relationship between post-traumatic stress disorder (PTSD) and killing in military combat. For this review killing in military combat refers to the act of taking another human life whilst serving in the military and during combat situations. Combat situations may include, but are not limited to; firing of a weapon at enemy occupied areas, strategic firing of weapon at identified individual or group, use of a weapon against a number of enemy combatants or killing a hostage. It is recognised that killing during combat can occur in self-defence and there is likely to be a wider range of combat related scenarios which result in the killing of another person during combat.

Defining PTSD

It was not until 1980 when PTSD was first defined as a diagnosis, when it was included in the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Nemeroff et al., 2006). This was occasioned by the veterans of the Vietnam War (MacNair, 2002) and a result of clinicians needing to account for the difficulties returning Vietnam veterans were presenting with (Shepard, 2001). They had difficulties sleeping, an overly sensitive reaction to stimuli, and experienced flashbacks; such presentations were commonly deemed to be delusional which often led to mis-diagnoses of schizophrenia (Stein, 2015). An estimated 700,000 Vietnam veterans required some form of psychological help, with delayed PTSD being a significant source of psychological suffering (Crocq & Crocq, 2000). Research identified that 15.2% of males and 8.5% of female Vietnam veterans were still suffering with PTSD 20 years after the war (Price, 2007), which posed a new challenge for those providing psychological support.

The recognition of PTSD as a clinical diagnosis was also influenced by socio-economic and political factors. Following investigations into the prevalence of PTSD in returning Vietnam veterans, a hearing was called before the Senate Committee on Veterans Affairs in January, 1970. During this Vietnam veterans described the intense confusion and terror they experienced during warfare, and the feelings they were left to face alone.

This hearing resulted in a new policy, which would seek to address the psychological trauma experienced by Vietnam veterans (Stein, 2015). The introduction of a diagnostic label also meant that individuals were able to claim compensation; prior to this those eligible for compensation had to have an observable physical injury (Wessely & Jones, 2004). The psychological symptoms of PTSD are not always observable or physical and therefore this marked a change in political recognition. Socially and politically PTSD became widely recognised as a potential consequence of warzone exposure. Prior to this, war related psychological symptoms such as nightmares about combat experiences and an increased tendency to angry outbursts, were known by many names including 'shell shock', 'combat exhaustion', and 'traumatic war neurosis' (Friedman, Schnurr & McDonagh-Coyle, 1994).

Following recent conflicts such as the wars in Afghanistan and Iraq, PTSD has been labelled one of the signature wounds of war (Nash & Litz, 2013). It has distinct clinical features which include repeated re-experiencing symptoms, such as flashbacks of the traumatic event, nightmares, repetitive intrusive memories and physiological reactions such as shaking and sweating, these occur in response to trauma related cues (Brewin, Dalgleish & Joseph, 1996). These cues may be smells, sights or sounds which remind the individual of the traumatic event. Flashbacks in particular, are known to be accompanied by a high level of psychological distress (Brewin et al., 1996).

Prevalence

Military trauma is reported to result in higher levels of psychological distress and impairment than other traumatic events (Naifeh et al., 2008); suggested to be accounted for by high rates of combat and killing of others (Grossman, 1996). This would suggest rates of PTSD to be higher in the military population; some have identified this to be as high as 35.8% (Friedman et al., 1994). Research has shown this rate to be higher in women than men (Nemeroff et al., 2006); although conclusions differ as to whether levels of self-disclosure account for these findings with men being less likely to seek help for mental health difficulties (Rogler & Cortez, 1993). The majority of

military trauma research into women has focused on sexual trauma, experienced during military service, sexual trauma increases the risk of PTSD symptoms in female veterans (Himmelfarb, Yaeger & Mintz, 2006), which may account for some of the differentiation in prevalence.

Estimating the prevalence of PTSD in the military is difficult, mainly due to the variability in samples and sampling methods (Richardson, Frueh & Acierno, 2011). Prevalence rates also differ between countries and between specific wars. For example, one study of Iraq War veterans in the United States (US) found the rate of PTSD to be as high as 17.1% (Hoge et al., 2004), whilst the rate in a sample of Iraq War veterans from the United Kingdom (UK) was 4% (Hotopf et al., 2006). Richardson et al. (2011) surmise this variation in rates may be due to socio-political and cultural factors which differ between nations, for example whether or not an individual feels able to seek support may be due to social and cultural norms or values.

Others have suggested this difference may be related to deployment length, with US troops more likely to experience longer periods of deployment, a risk factor for adverse mental health and wellbeing (Buckman et al., 2011). This was the case with the Vietnam War, where US troops were deployed for longer periods and were more likely to experience multiple traumas (Keane, Zimering & Caddell, 1985) and more intense combat which is a known risk factor for PTSD (Friedman et al., 1994; Grossman, 1995; Naifeh et al., 2008). Vietnam War veterans also have a higher lifetime prevalence rate of PTSD at 30.9% (Richardson et al., 2011). This is much higher than the rates detailed above for Iraq veterans. Although prevalence rates are considered to be lower in Iraq or Afghanistan veterans, PTSD was still shown to be one of the most prevalent mental health difficulties, with 13.8% meeting criteria for this condition (Tanielian & Jaycox, 2008).

Personal impact

Despite being trained for combat and the act of killing others, soldiers can still experience mental health difficulties which are caused by this experience

(Grossman, 1996). The degree of impact is reflected in the high rates of suicide in this population. The US Department of Veterans Affairs (2013) estimated 22 veterans committed suicide every day in the year 2010; accounting for 22.2% of all suicides in the US that year. Conner et al. (2013) concluded, from a sample of nearly three million veterans, that almost half who died by suicide also had mental health difficulties, and 11.7% of those had PTSD. This highlights the serious impact that mental health difficulties can have on this population, despite the training they receive.

The symptoms of PTSD can vary in their chronicity which can impact on veterans long-term and can cause difficulties when adjusting back to civilian life (Sayer et al., 2010). Individuals with military related PTSD have been shown to have a higher tendency for isolation (Monson, Taft & Fredman, 2009), less social inclusion (Sayer et al., 2010) and heightened aggressiveness (Jakupak et al., 2007). In a study of Iraq and Afghanistan combat veterans receiving medical care, an estimated 25-56% reported difficulties with social functioning, productivity, community involvement and self-care (Sayer et al., 2010). Sayer et al. (2010) importantly note that many of these identified difficulties lie outside the traditional role of healthcare, therefore identifying the need for professionals trained specifically to work with this population.

Engaging in traumatic acts and PTSD

Within military research exposure to life-threatening situations is well recognised as a robust predictor of PTSD (Hassija, Jukupeak, Maguen & Shipherd, 2012), as it is across other non-military populations. In addition, a number of stressor types that do not constitute life-threatening situations have also been found to correlate with PTSD; such as witnessing atrocities, the loss of close friends and the act of killing (Currier & Holland, 2012). It is widely documented that there are a range of situations in which an individual may develop PTSD where there was no threat to life. For example, there are long documented cases where it is specifically the carrying out of a traumatic act during combat that has led to PTSD (Dennis et al., 2017). It was identified that carrying out the traumatic act can be equally psychologically

damaging when compared to being subject to the trauma (Dennis et al., 2017).

Since the 1970s clinicians have noted that engaging in killing has a psychological impact on the military and veteran population (Haley, 1974). Litz et al. (2009) explain that the psychological distress occurs due to the internal conflict which arises when actions transgress deeply held moral beliefs. The inner conflict which arises has more recently been defined as moral injury (Drescher et al., 2011), and can be accompanied by feelings such as guilt and shame (Nazarov et al., 2015). Shame is defined as a painful emotion which involves negative evaluation of the self (Tangney, 1991) and feelings of worthlessness and powerlessness (Leskela, Dieperink, & Thurus, 2002). In comparison, guilt involves the belief that one should have thought, acted or felt differently (Kubany, 1994), and is often accompanied by feelings of regret and remorse (Leskela et al., 2002).

Whilst moral injury is a fairly new psychological concept, the likelihood of engaging in morally injurious acts is well documented in the literature as being increased during combat exposure (Frankfurt & Frazier, 2016); possibly due to the close proximity of combat (Farnsworth, Drescher, Nieuwsma, Walser & Currier 2014). In a study of US veterans from OEF and OIF, 40-50% of soldiers reported killing an enemy combatant (Hoge et al., 2004). Although, it is possible to assume that this could be higher for those who served on the front-line. This supports the conclusion that combat exposes a high percentage of military personnel to events which may be considered to transgress moral beliefs.

Rationale for the review

The aim of this review is to provide a synthesis of existing literature identifying what is known about the relationship between post-traumatic stress disorder and killing in combat. This is the first review to consider this topic which is an important consideration for anyone working therapeutically with this population. Killing during combat is a unique experience, and for the majority is limited to military service. Therefore clinicians working with this

population may benefit from a synthesis of this area of research in order to be able to fully address and understand the psychological impact that killing can have on military personnel. The focus is on addressing the specific question: what is known about the relationship between post-traumatic stress disorder and killing in combat? For this purpose, the focus is on serving military and veteran populations.

Method

Search Strategy

A search of existing literature was conducted in a systematic manner. A number of databases were selected through the following host websites: EBSCOhost, Web of Science and Cochrane. The databases included; PsychINFO, PsychARTICLES, AMED, CINAHL Plus, SPORTDiscus, MEDLINE, PsychBOOKS, eBook Collection. The author also consulted grey literature by searching Ethos, an online host for unpublished dissertations. This minimised bias in the search strategy. Reference lists from key texts were also hand searched.

The literature search was conducted in August 2017 using the following search terms: (PTSD OR post-traumatic stress disorder OR posttraumatic stress disorder OR post traumatic stress disorder) AND (combat OR military OR war OR veteran OR arm* force OR deployment OR deployed) AND (kill* OR atrocity* OR fatal OR taking life OR exec* OR transgressive act). A start date of the year 1980 was applied as a limiter to the search as this is when PTSD was first included in the Diagnostic and Statistical Manual (DSM).

Inclusion and exclusion criteria

Studies were included in this review if they met the following inclusion criteria:

- Participants with a diagnosis of PTSD or the participants completed a valid measure of PTSD symptoms

- The article must report on the direct relationship between PTSD and killing in combat
- The act of killing is a variable
- Articles published in the English language (due to lack of translation resources)

Studies were excluded from this review based on the following criteria:

- Participants not currently serving military personnel or veterans
- Participants under the age of 16 years; as this review focuses on a population that are serving legitimately in the military and not as child soldiers

The initial search produced 1,420 articles, of these 768 duplicates were removed. At the first stage of screening the title and abstract was read to determine whether the articles met the inclusion and exclusion criteria; this resulted in retention of 72 articles. Where it was unclear from the title and abstract, the full text was read to determine whether the article met inclusion for this review. This resulted in retention of 10 articles. Figure 1 illustrates the search strategy.

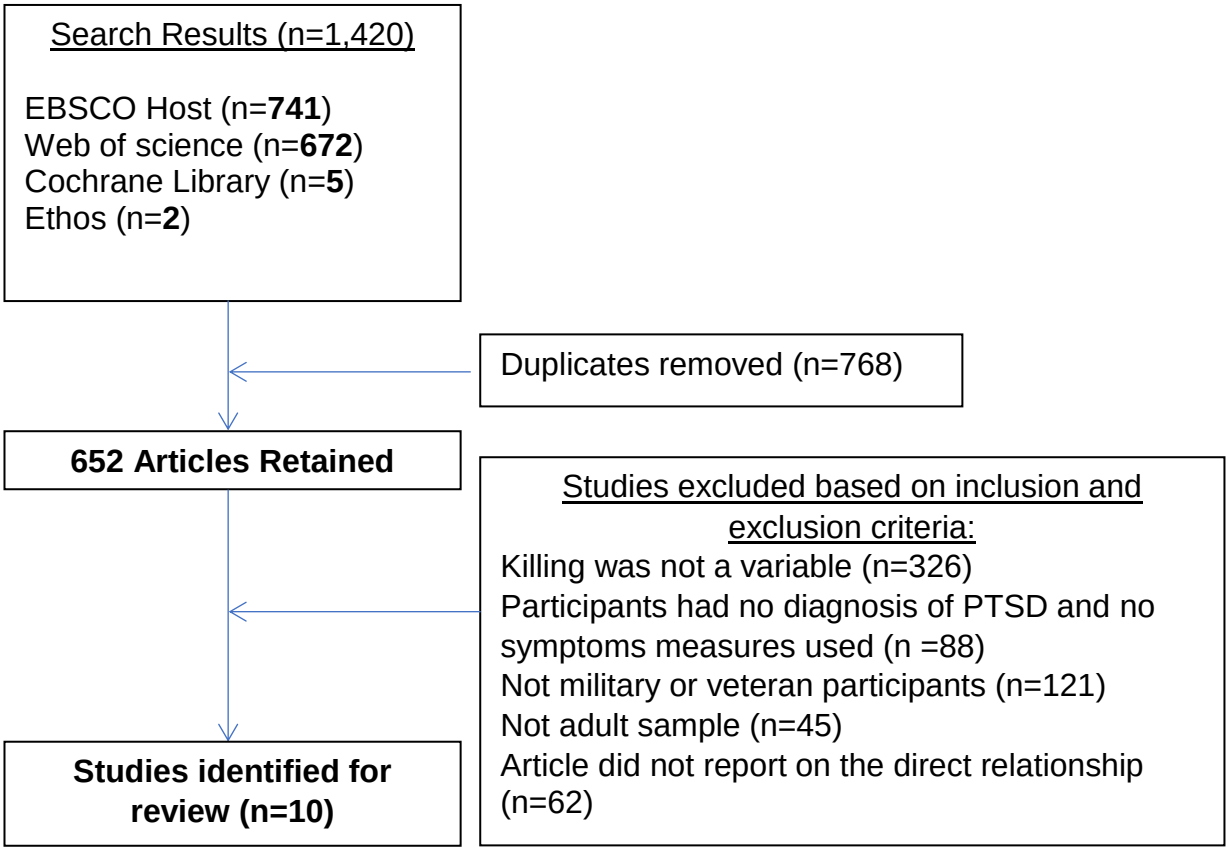

Figure 1: *Flowchart of search strategy*

Data extraction and quality considerations

The critical appraisal tool used to inform data extraction was compiled by the author in line with recommendations by Young and Solomon (2009) and the Strengthening the Reporting of observational Studies in Epidemiology checklist (STROBE) (Von Elm et al., 2008). Despite each of these being a comprehensive guide to reviewing literature, it was not possible to utilise one tool as both included several questions unrelated to the method of the reviewed articles. In addition to Young and Solomon's guidelines, the STROBE checklist provides specific guidance on the critical appraisal of observational studies (Von Elm et al., 2008). All of the articles in this review were observational, supporting its use in addition. The full checklist compiled by the author is available in *Appendix B.*

In order to provide a measure of quality, the author assessed each article in respect of whether it addressed each of the questions on the checklist. This

was rated on a scale of ‘Yes’, ‘Partial’ or ‘No’ and each assigned a score from 2-0, which was used to rate the degree to which each article met the conditions for each question. Full details of the rating scales can be found alongside the data extraction table in *Appendix C.*

Results

Study characteristics

All of the studies in this review recruited from US populations. It is surprising that there was no British literature in this area and this greatly affects the generalisability of these studies to populations outside of the US. It is not possible to conclude with certainty why there is a lack of British literature on this topic; it may be due to social and political differences between the US and the UK (Richardson et al., 2011) which have influenced the direction of military research, although this would need further investigation.

All ten of the articles in this review used a quantitative methodology and were observational studies with a cross-sectional design. One study used a comparison group to compare combat veterans who killed with those that did not (MacNair, 2002). The remainder completed regression analyses on the whole participant sample (Maguen et al., 2009; Maguen et al., 2010; Pietrzak, Whealin, Stotzer, Goldstein & Southwick, 2011; Van Winkle & Safer, 2011; Maguen et al., 2013; Pitts et al., 2014; Shea, Presseau, Finley, Reddy & Spofford, 2016; Tripp, McDevitt-Murphy & Henschel, 2016; Goldstein et al., 2017). A summary of the participants, design and findings for each study can be found in *Table 1,* along with the main strengths and limitations.

Table 1: Summary of study design, strengths and limitations

Author and Place	Participants and Setting	Design	Findings	Strengths	Limitations
Pietrzak et al., 2011 USA	N = 285 Mean age 33.4yrs. Male and female. Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans.	Regression. Combat Experience Scale (CES; Vogt, Smith, King, King, Knight & Vasterling, 2013). Posttraumatic Stress Disorder Checklist-military version (PCL-M; Blanchard, Jones-Alexander, Buckley & Forneris, 1996).	Killing significantly associated with re-experiencing symptoms. 45.6% of respondents with PTSD reported killing compared to 15% without PTSD.	Method. Clear results. Confidence intervals. Considered existing literature.	No power calculation. Not representative. Not generalisable.
Shea et al., 2016 USA	N = 206 93% male. Mean age 33.79yrs. National Guard and Reserve	Regression. Clinically-Administered PTSD Scale for DSM-IV (CAPS-IV; Blake et al., 1995). Exposure to combat - self-report measure developed by	Having killed not significantly associated with PTSD symptoms of numbing, avoidance, re-	Clear analysis. Acknowledged limitations. Inter-rater reliability good.	Skewness and Kurtosis violated. No confidence intervals. Not generalisable. No power

	members Iraq or Afghanistan. 9.2% met criteria for PTSD.	author. Anxiety and depression subscales - Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983).	experiencing or hyperarousal.		calculation.
Tripp et al., 2016 USA	N = 68 91% male. Mean age 32.31yrs. OEF and OIF veterans. 57% met PTSD criteria.	Regression. Deployment Risk and Resilience Inventory (DRRI; King, King, Vogt, Knight & Samer, 2006). Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990). Beck Depression Inventory – II (BDI-II; Beck, Steer & Brown, 1996). Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente & Grant, 1993). Timeline Followback (TLFB;	Killing significantly associated with CAPS total severity. Killing = significantly higher mean CAPS score.	Clear analysis. Accounted for missing data. Accounted for confounder. Confidence intervals.	Not generalisable. Reduced statistical power.

		Sobell & Sobell, 1996).			
Maguen et al., 2013 USA	N = 227 84% male. Mean age 34.1yrs. OEF and OIF veterans. All met DSM-IV criteria for sub-threshold or full PTSD.	Regression. PCL-M (Blanchard et al., 1996). DRRI (King et al., 2006). Participants asked specifics about nature of 'killing'.	Those who killed had twice the odds of more severe PTSD symptoms when compared to those who did not kill. Characteristics of person killed significant.	Confidence intervals. Discussed power. Clear analysis. Considered confounders.	Not generalisable. Recruitment unclear. Sample taken from previous research. Not representative.
Pitts et al., 2014 USA	N = 345 82% male. Mean age 27.97yrs. Army combat medics. Iraq or Afghanistan veterans. 9% probable PTSD.	Regression. PCL-M (Blanchard et al., 1996). CES (Vogt et al., 2013). Combat Experiences (CE; Castro & McGurk, 2007). Aftermath of Battle Scale (King, King & Vogt, 2003). Author developed measure of killing.	Those who reported killing were more likely to report symptoms of PTSD. Killing not a predictor of PTSD.	Clear data collection method. Considered implications of findings.	Recall bias. Not generalisable. 2 year follow-up not reported in results or discussion.

MacNair, 2002 USA	N = 1638 Vietnam-era veterans. 2 groups: those who killed (639) and those who did not (963).	Regression. Mississippi Scale for Combat-Related PTSD (MCS; Keane, Caddell & Taylor, 1988). One item from the National Vietnam Veteran Readjustment Study questionnaire pack.	Mean score on MCS for those who killed higher than those who did not. When battle intensity held constant = killing still predictive.	Considered confounding factors. Stratified sample. Clear analysis. Recognises limitations.	Data not collected for this study design. Did not consider what the findings add. No confidence intervals.
Maguen et al., 2009 USA	N = 1200 Subsample n = 259 Male only. Vietnam veterans.	Regression. Measure of killing developed by authors. MCS (Keane et al., 1988). Minnesota multiphasic Personality Inventory-2 PTSD Keane Scale (MMPI-PK; Keane, Malloy & Fairbank, 1988). Peritraumatic Dissociative Experiences Questionnaire (PDEQ; Marmar, Metzler & Otte, 2004).	Those who killed combatants scored higher on all symptom measures. Those who reported killing civilians scored higher on MCS. Significant relationship between MCS and killing.	Clear analysis. Considered confounders. Considered what results add to existing evidence .	Not representative. Lacks generalisability. No power calculation. No confidence intervals reported.

		Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams & Gibbon, 1987). Combat exposure measure developed by authors. Violent behaviour measure developed by authors.			
Maguen et al., 2010 USA	N = 2797 94% male. Mean age 28yrs. 40% reported having killed. OIF soldiers only.	Regression. Primary Care PTSD Screen (PC-PTSD; Prins et al., 2003). Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002). AUDIT (Saunders et al., 1993). Dimensions of Anger (DAR; Novaco, 1975). Relationship problems - developed by authors. Direct and indirect killing –	Direct and indirect killing was a significant predictor of PTSD after controlling for combat exposure.	Accounted for confounders. Large sample size. Representative. Clear analysis. Reported confidence intervals.	Not generalisable. Regressions did not explain a large percentage of the variance. No power calculation.

		developed by authors.			
Van Winkle & Safer, 2011 USA	N = 376 Male only. Vietnam veterans.	Regression. Combat exposure variables - developed by author. Inferred combat exposure questions - developed by author. Questions about killing - developed by the author. MCS (Keane et al., 1988). Questions on domestic physical violence – developed by author.	Inferred measure of killing significantly predicted PTSD. Direct measure of killing significantly predicted PTSD. Killing highly correlated with witnessing trauma.	Possible confounders accounted for. Clear analysis. Authors recognised limitations.	Bias in recruitment. Not representative. No power calculation. No confidence intervals.
Goldstein et al., 2017 USA	N = 383 Female only. Mean age 49.3yrs. 34.5% met PTSD criteria. 15% reported killing in combat.	Regression. Eight-item military trauma exposure self-report measure – author developed. PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013).	Killing others not significantly associated with PTSD.	Clear analysis. Generalisable. Consider what the results add to existing literature. Results clearly defined. Large sample size.	Bias in recruitment. Not representative. No power calculation. No confidence intervals.

		PHQ-9 (Kroenke & Spitzer, 2002).			

Study results

There was disparity amongst the studies on the relationship between PTSD and killing. Seven of the articles reported a significant relationship between having killed in combat and severity of PTSD symptoms (MacNair, 2002; Maguen et al., 2009; Maguen et al., 2010; Maguen et al., 2013; Pietrzak et al., 2011; Tripp et al., 2016; Van Winkle & Safer, 2011); meaning, those who killed in combat were more likely to report a significantly greater severity of PTSD. Three of the studies did not find a significant relationship (Goldstein et al., 2017; Pitts et al., 2014; Shea et al., 2016). One study by Pietrzak et al. (2011) looked at four PTSD symptom clusters; identified as re-experiencing, avoidance, dysphoria and hyperarousal symptoms. Only re-experiencing symptoms were significantly associated with having killed in combat. One study also found that the characteristics of the person killed (e.g. age) were an important factor (Maguen et al., 2013). Specifically, having killed a woman, child or elderly person meant that the individual whom killed was 4.6 times more likely to report a high degree of PTSD symptoms (Maguen et al., 2013).

It is interesting to note, that the study by Goldstein et al. (2017), which recruited only female participants, found no significant relationship between killing in combat and severity of PTSD. This had a large sample size of 383. However, the percentage of those that endorsed having killed in combat was relatively low at 3.9% (n=15). The most commonly experienced trauma type was sexual harassment (65.3%). As such it is queried whether the findings reflected the low rate of having killed in combat and that the sample had predominantly experienced sexual trauma.

Critical Appraisal

Participants

Participants in the majority of studies were recruited from specific conflicts, with only one study not recruiting from a specific war or military operation (Goldstein et al., 2017). This reduces the generalisability of the samples to the wider military population who may not have experienced these particular

conflicts. As such, the studies that recruited participants who had served in the conflicts in Afghanistan and Iraq (Maguen et al., 2012; Pietrzak et al., 2011; Pitts et al., 2014; Shea et al., 2016; Tripp et al., 2016), the Vietnam War (MacNair, 2002; Maguen et al., 2009) and from Iraq only (Maguen et al., 2010; Van Winkle & Safer, 2011) may be limited in their ability to generalise to other conflicts.

It could be assumed however, that the experience of combat during similar time periods is relatively comparable. Comparison proves more challenging if asked to compare results from World War I, for example, with modern conflicts; where the nature of combat is significantly different. Evidence also suggests that Vietnam, Iraq and Afghanistan veterans endorse similar frequencies of taking life of enemy combatants and civilians (Maguen et al., 2009). Therefore the participants across the studies contained within this review are comparable both in terms of the frequency of killing experienced during combat and as they all pertain to what might be considered modern warfare tactics and combat situations; supporting their comparison for the purpose of this review.

The majority of studies recruited both male and female participants (Maguen et al., 2010; Maguen et al., 2013; Pietrzak et al., 2011; Pitts et al., 2014; Shea et al., 2016; Tripp et al., 2016). The percentage of males ranged from 82-94%. Although high, this figure is reflective of the reported percentage of males serving in the US military, which was recorded in 2015 to be 81% (Department of Defence, 2015). Two studies recruited only male participants (Maguen et al., 2009; 2011; Van Winkle & Safer, 2011) and therefore neither reflects the actual military population. The percentage of women serving in the US military is reported to have increased since the year 2000 (Department of Defence, 2015). This would explain why any data prior to this time might have a higher percentage of male participants. Although it would be expected that some females would have been eligible participants had the studies sought to recruit them. Goldstein et al. (2017) recruited only female participants, which is also a limitation, however with a large sample size (n=383) it provides the opportunity to consider any gender differences, which

would otherwise be limited by the small number of female participants in the other studies.

Representativeness

Only three of the studies can be said to have recruited samples through methods which meant that the sample was representative (MacNair, 2002; Maguen et al., 2010; Shea et al., 2016; Tripp et al., 2016). In two of the studies all serving personnel were eligible for participation on return from active deployment to Iraq (Maguen et al., 2010) or Iraq and Afghanistan (Shea et al., 2016). They were recruited at post-deployment health screening assessments which are mandatory and therefore it is not expected that these samples are not representative of the returning military populations studied. In the study by MacNair (2002) the sample was a large stratified random sample which is also anticipated to yield a representative sample of Vietnam veterans.

The method of participant recruitment affected the representativeness of the sample in four of the studies (Maguen et al., 2009; Maguen et al., 2013; Pietrzak et al., 2011; Pitts et al., 2014). In particular, Maguen et al. (2009) drew on a subsample of participants who had to live within a specified distance of the interview sites; this resulted in bias at the recruitment stage. As such, the sample was not representative of the wider population. Similar geographical difficulties were evident in the studies by Goldstein et al. (2017), Maguen et al. (2013), and Pitts et al. (2014) whereby participants were recruited from specific geographical locations. Despite this limitation, the study by Goldstein et al. (2017) was not limited to any specific conflict and therefore is likely to be more representative of the female military population within the areas that the researchers recruited from.

Pietrzak et al. (2011) chose a sample that was the first 1050 names, alphabetically ordered, of prospective eligible participants. This was due to practical constraints and a high number of eligible veterans. This strongly limits the representativeness of this sample as it is not random, although it is a strength of this study that the authors recognise this in their discussion.

Design

All of the studies in this review had clear research questions or hypotheses and all were cross-sectional in design. Being cross-sectional the data are only relevant to the specific point in time that the data was collected. This design is appropriate when looking at relationships between variables as many variables can be considered at once. It was also an appropriate design for all of the studies because there was no manipulation of variables or the environment by the researcher that needed to be investigated.

The limitation with a cross-sectional design is that it cannot infer causality. When collecting data at one specific time point, it is not possible to know whether certain factors have made an individual more or less likely to develop PTSD because it is not possible to know whether for example, PTSD was present before the act of killing. A longitudinal design may be an important consideration for future research whereby a baseline could be established. This would provide opportunity for comparison of data collated in order to be able to suggest causality factors. It is recognised by the author that causality is often difficult to ascertain, and that many other variables, some of which may be confounding factors, would need to be taken into account. Six of the studies included in this review accounted for possible confounding variables in their design (MacNair, 2002; Maguen et al., 2009; Maguen et al., 2010; Maguen et al., 2013; Tripp et al., 2016; Van Winkle & Safer, 2011).

Including possible confounding factors is important to ensuring the validity of the results. Confounders can influence the findings, resulting in either a masking of an association between variables or falsely demonstrating an association where there is not one (Skelly, Dettori & Brodt, 2012). The degree of combat exposure is one common confounding influence (Friedman et al., 1994) as discussed above. It is a limitation that only two of the studies included degree of combat exposure as a variable in the design (MacNair, 2002; Maguen et al., 2009).

Data analysis

For all of the studies the method of data analysis was clear and appropriate to the research question. The study by Van Winkle and Safer (2011) was the only one where the method of data collection was not clearly stated. This raises concerns as to the validity of the results reported and whether bias existed at the data collection stage which would limit the findings of this study.

It is relevant to consider the sample sizes when reflecting on the analyses for the studies included in this review. Carrying out a power analysis informs the recommended sample size that is necessary for the results to have statistical power. Statistical power refers to the likelihood that a study will detect an effect if there is one. It is therefore, crucially linked to the effect size, which identifies the relationship between variables and the proportion of explained variance that the model accounts for. Of the ten studies in this review, only one (Maguen et al., 2013) detailed a power calculation and made reference to their sample size. This study had a sample size of 227 with three predictor variables and calculations indicated sufficient power. There is, therefore, a lack of transparency across the rest of the studies. The study by Tripp et al. (2016) raises concerns about power with a sample size of only 68 and seven variables. Being under-powered increases the likelihood that a statistically significant finding is falsely positive, it can also increase the risk of a type II error, reducing the probability of a difference being found where there is one (Christley, 2010). This raises ethical concerns about the robustness of the data and the reliability of results.

The majority of articles made reference to whether there was missing data, with four of these removing it prior to analysis (Goldstein et al., 2017; Maguen et al., 2010; Pitts et al., 2014; Shea et al., 2016). Removal of missing data can cause bias in estimation of the parameters which is more of a concern in situations where studies are under-powered (Kang, 2013). On observation, all of the studies that removed missing data appeared to have sufficient sample size to consider the studies to be adequately powered (Goldstein et al., 2017; Maguen et al., 2010; Pitts et al., 2014; Shea et al.,

2016), although absent of power calculations this is not certain. Three of the four studies have sample sizes between 300 and 400 with the number of variables ranging from between six and twelve (Goldstein et al., 2017; Pitts et al., 2014; Shea et al., 2016). The study by Maguen et al. (2010) however has a very large sample size of 2,797 with only seven predictor variables. This may have had an influence on the findings, as a large sample could result in a large probability of obtaining significance, even when the effect is small. Indeed, the final mode in this study accounted for a small proportion of the variance which may be a reflection of this limitation. As such the findings of this study should be interpreted with caution.

It is likely that the researchers removed missing data prior to analysis due to completing a regression which requires a full dataset with no missing data (Rubin, Witkiewitz, Andre & Reilly, 2007). Three studies made no reference to missing data (MacNair, 2002; Maguen et al., 2013; Pietrzak et al., 2011) and so it is not possible to infer whether or not data was missing. Maguen et al. (2009) did not account for missing data and included participant responses which had some data missing in their analysis. They did not discuss this in their article or identify the percentage of data missing. Whilst it is not possible to definitively state that the missing data has influenced the results, it is a limitation of this study that it is not addressed by the author.

One study (Tripp et al., 2016) performed a mean substitution test prior to analysis to handle missing data. Mean substitution restricts the variability of the data and the distribution becomes more peaked at the mean (Allison, 2002). Mean substitution results in the mean of a missing dataset being replaced with the mean of a non-missing dataset, this preserves the mean of the overall dataset. Therefore this method of handling missing data does not add any new information to the analysis and could, as such, result in an underestimation of errors (Kang, 2013). Although Tripp et al. (2016) accounted for the missing data prior to analysis; the results should be interpreted cautiously.

All of the studies reported the exact significance values (p-value) of their findings. Of these, however, confidence intervals were not reported in five studies (Goldstein et al., 2017; MacNair, 2002; Shea et al., 2016; Pitts et al., 2014; Van Winkle & Safer, 2011). Confidence intervals provide the range in which the true value lies, therefore providing a more accurate evaluation of the data. In the absence of confidence intervals, it is difficult to determine the true effect which leaves questions as to the precision and reliability of the conclusions in these studies.

What appeared to be consistent across the majority of articles is that participants that had killed during combat were more likely to report PTSD symptoms (MacNair, 2002; Maguen et al., 2009; Maguen et al., 2010; Maguen et al., 2013; Pietrzak et al., 2011; Pitts et al., 2014; Tripp et al., 2016; Van Winkle & Safer, 2011). They also had higher mean PTSD symptom severity scores when compared with participants that did not report killing (Tripp et al., 2016). Pietrzak et al. (2011) found that 45.6% of participants with PTSD reported killing compared to 15% of participants without PTSD (n=285). In the discussion of this study the authors identified the difficulty in determining the directional relationship between these variables. They allude to whether individuals with PTSD are more likely to kill during combat due to their symptoms, in comparison to the assumed direction that those who have killed in combat may develop PTSD (Pietrzak et al., 2011). Longitudinal research designs, with pre-combat baseline measures of PTSD symptoms and follow-up data with individuals who have killed in combat, would provide data that could help clarify this.

Characteristics of person killed

Two of the studies investigated the characteristics of the person killed as a predictor variable (Maguen et al., 2009; Maguen et al., 2013). Maguen et al. (2009) used data from the NVVRS study whilst Maguen et al. (2013) recruited only Iraq and Afghanistan veterans. Results from the Vietnam veterans study concluded that where participants reported killing civilians, women, children, the elderly or prisoners during combat, their PTSD symptom severity score was higher (Maguen et al., 2009). There was

however, a low number of participants endorsing the items for having killed each of these particular groups (civilians 3%, women, children or elderly 13%, prisoner 2%); therefore inferences should be treated cautiously. In the study by Maguen et al. (2013) which recruited 227 participants, 39% reported having killed another person, of these 50.7% reported killing enemy combatants and 48.5% reported killing both enemy combatants and at least one other type of person (child, women, male civilian, elderly or detainee). With a larger percentage of respondents endorsing these items, they found that having reported killing a woman, child or elderly person resulted in that individual being 4.6 times more likely to have a high rate of PTSD symptoms (Maguen et al., 2013).

During more recent conflicts, where the enemy are unmarked and often in urban areas, the likelihood of harming civilians is increased (Nazarov et al., 2015). Previous research into atrocities, such as killing civilians, suggests such acts correlate with negative emotions such as guilt (Fontana & Rosenheck, 2004). This is particularly true when the traumatic event involves acts which violate deeply held moral beliefs (Litz et al., 2009). Guilt has also been suggested to precipitate the development of PTSD (Dennis et al., 2017) which may account for the difference in PTSD symptom severity. For individuals reporting having killed women, children, the elderly or prisoners (Maguen et al., 2009; Maguen et al., 2013) their PTSD symptom severity scores may be higher due to feelings of guilt.

Despite the cautionary interpretation, the findings highlight how certain characteristics of those killed may play a role in determining the severity of PTSD. Clinicians should therefore consider the killing experience that military or veteran clients bring with them. The context is an important consideration, for example, the evidence would suggest a scenario in which civilians are killed would lead to a greater severity of PTSD. Clinicians should be mindful of the impact that the characteristics of the person killed may have on the individual responsible, with acknowledgement that killing children, the elderly, detainees or civilians may result in greater PTSD severity.

PTSD symptoms

Several articles report a differing relationship between specific PTSD symptoms and killing in combat (Maguen et al., 2009; Pietrzak et al., 2011; Shea et al., 2016). Pietrzak et al. (2011) considered four symptoms, namely re-experiencing, avoidance, dysphoria and hyperarousal. The results demonstrated that killing in combat was only related to re-experiencing symptoms (Pietrzak et al. 2011). It is a limitation that in this study they neglected to consider symptoms outside of these four categories. The findings are also in contrast to the results of Shea et al. (2016), which similarly investigated the same four symptoms. Interestingly their study also focused on Iraq and Afghanistan veterans; however, the results showed no significant relationship between killing in combat and any of the PTSD symptoms investigated. Maguen et al. (2009) included peri-traumatic dissociation as one of the variables. They found that when controlling for general combat experiences, killing both combatants and non-combatants significantly predicted peri-traumatic dissociation. In the discussion they propose that killing another human may increase the likelihood of peri-traumatic dissociation because of the profound sense of unreality associated with this act. They go on to suggest that peri-traumatic dissociation may, as such, serve to shut down or minimise the feelings associated with the act of killing which then interferes with processing, leading to the development of PTSD. Whilst the findings on different PTSD symptoms and killing in combat are limited to results from only three studies in this review, they do provide foundations for the future consideration of specific factors involved in killing, such as the emotional experience at the time.

Discussion

In summary, there were some differences and similarities between the studies included in this review when considering the relationship between PTSD and killing in combat. The majority of studies acknowledged that killing in combat correlated with higher PTSD symptom scores; although three did not find this relationship to be statistically significant. The inconsistency between some of the findings would suggest that the link between killing in

combat and PTSD requires further attention and exploration. What differentiates these findings, aside from the limitations of the studies included in this review, may be influencing factors such as degree of combat exposure or gender. However, these factors need further investigation.

Some of the studies found a difference in the relationship between killing in combat and different PTSD symptoms, such as re-experiencing symptoms (Pietrzak et al., 2011). Additionally in relation to the killing of civilians, certain characteristics of the person killed were important, such as whether they were children, women, the elderly or prisoners. This was shown to correspond with a higher reporting of PTSD symptoms (Maguen et al., 2009). It was beyond the scope of the articles included in this review to determine the factors involved in the killing of these specific types of people that resulted in more severe PTSD presentations. Further examination of other potentially relevant variables is needed.

Overall, all of the studies met at least half of the critical appraisal tool questions although none were without their limitations. The majority of studies were limited by the representativeness of the sample, lack of generalisability and lack of transparency about statistical power. Nearly all studies chose to recruit participants that had served in specific conflicts such as the Vietnam War or the conflict in Afghanistan. Existing literature has shown the degree of combat exposure to be a significant predictor of PTSD (Grossman, 1996). These studies have however, recruited from populations that have been exposed to a greater degree of combat, such a Vietnam veterans, and were likely to have a higher rate of PTSD. This makes the findings less generalisable to the US military population as a whole. There are also geographical limitations within some of the studies. Some of the reasons for this may be down to resource as was the case in the study by Pietrzak et al. (2011) whereby only the first 1050 were contacted due to the length of time it would take to sort through over 200,000 eligible veterans.

Clinical Implications

Although it is difficult to conclude that a significant relationship exists between killing in combat and PTSD based on the disparity in the studies, some salient points can be highlighted. The majority identified that an individual who killed in combat is more likely to report symptoms of PTSD. This alone indicates the need for clinicians working with serving military personnel and veterans to ask about killing in combat during assessment. It is well recognised that military and ex-military personnel believe that the public stigmatises veterans with PTSD, labelling them as 'dangerous' or 'violent' (Mittal et al., 2013), and so the topic of killing must be addressed sensitively and without judgement.

It is also important to consider the context in which killing in combat occurred, particularly the characteristics of the person killed and specifically how these factors have impacted on the person who killed. Not considering these factors may result in assessment and formulation processes which neglect to account for the inner conflict and emotional distress. This would also indicate a need for interventions to be responsive to individual need. Traditionally, PTSD was assumed to result from being exposed to life-threatening situations (Drescher et al., 2011), therefore as the person who killed, their emotional distress may derive from a very different set of processes. Within this it should not be assumed that having killed during combat is the same for everyone. The studies in this review show that different contexts account for differing symptom severities.

Future research

Future research should utilise longitudinal research designs and baseline measures of PTSD that may be more useful in determining whether killing in combat is a valid predictor of PTSD. Research should aim to recruit participants that are more representative of the populations studied. Several studies have drawn on data collected around the 1980's; there are more up to date military populations that could be recruited from in order to gain current data. It would be necessary, considering the difference in combat experiences between nations and differences in cultural perceptions of

killing, for research to be conducted outside of the US population. This would allow for comparisons across nations and a greater exploration of the factors involved in the relationship between PTSD and killing in combat.

Limitations of the review

There are some limitations to this review which need to be considered. The appraisal tool used to critique articles was developed by the author as an amalgamation of two existing critical appraisal tools and was not standardised. Whilst the STROBE checklist (Von Elm et al., 2008) and Young and Solomon (2009) guidelines are recognised in existing literature as valid and comprehensive tools for this purpose, the tool generated for this review has not been applied previously or validated. It is therefore possible to assume that in generating the tool decisions were influenced by the researcher's own interpretation of the articles, views about what may be important to consider, and interest in the topic.

Whilst a systematic search of the literature was conducted, it is possible that some publications may have been missed through either hand searching or articles not being listed in the identified databases. Attempts were made to reduce publication bias through searching of unpublished theses, however none of these met the inclusion criteria for this review. It is possible that unpublished research has been missed in this process.

The search strategy did not produce any studies outside of the US population and thus the findings of this review are limited to this nation. Similarly, several studies used data from the same Vietnam War sample with others focusing on Afghanistan and Iraq veterans. This has produced an overview of findings which does not account for other conflicts and those who are deployed on other military operations.

Conclusion

Overall, the evidence for the relationship between PTSD and killing in combat appears complex. Research identifies that those who kill during combat are more likely to report PTSD symptoms. Disparity exists over whether this relationship is statistically significant, however several studies have shown that those who killed during combat reported a significantly greater severity of PTSD. There are factors such as victim characteristics and gender, which may influence the course of this relationship. The limitations of the studies included in this review should be taken into consideration. In particular, the majority, although not all, were limited by lack of a representative sample and generalisability. There are also issues with statistical power and transparency, which limits the reliability of some of the conclusions made.

It has previously been reported that disparity exists between nations on the prevalence of PTSD in the military (Richardson et al., 2010), therefore it would be presumptive to generalise findings worldwide. There is, however, sufficient evidence to conclude that the relationship between PTSD and killing in combat is important to consider. Clinicians should address the topic of killing during combat in their assessments and formulation, in order to gain a greater understanding of the origins of a client's distress. Future research should aim to unravel the complexities of this relationship by considering potential influencing factors. Research should aim to provide evidence that is representative, generalisable, and from different nations.

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Appendix A: Author guidelines for British Journal of Psychology

Author Guidelines

The Editorial Board of the British Journal of Psychology is prepared to consider for publication:

(a) reports of empirical studies likely to further our understanding of psychology

(b) critical reviews of the literature

(c) theoretical contributions Papers will be evaluated by the Editorial Board and referees in terms of scientific merit, readability, and interest to a general readership.

All papers published in The British Journal of Psychology are eligible for Panel A: Psychology, Psychiatry and Neuroscience in the Research Excellence Framework (REF).

1. Circulation

The circulation of the Journal is worldwide. Papers are invited and encouraged from authors throughout the world.

2. Length

Papers should normally be no more than 8000 words (excluding the abstract, reference list, tables and figures), although the Editor retains discretion to publish papers beyond this length in cases where the clear and concise expression of the scientific content requires greater length.

3. Submission and reviewing

All manuscripts must be submitted via Editorial Manager. The Journal operates a policy of anonymous (double blind) peer review. We also operate a triage process in which submissions that are out of scope or otherwise inappropriate will be rejected by the editors without external peer review to avoid unnecessary delays. Before submitting, please read the terms and conditions of submission and the declaration of competing interests. You may also like to use the Submission Checklist to help you prepare your paper.

4. Manuscript requirements

• Contributions must be typed in double spacing with wide margins. All sheets must be numbered.

• Manuscripts should be preceded by a title page which includes a full list of authors and their affiliations, as well as the corresponding author's contact details. You may like to use this template. When entering the author names into Editorial Manager, the corresponding author will be asked to provide a CRediT contributor role to classify the role that each author played in creating the manuscript. Please see the Project CRediT website for a list of roles.

• The main document must be anonymous. Please do not mention the authors' names or affiliations (including in the Method section) and refer to any previous work in the third person.

• Tables should be typed in double spacing, each on a separate page with a self-explanatory title. Tables should be comprehensible without reference to the text. They should be placed at the end of the manuscript but they must be mentioned in the text.

• Figures can be included at the end of the document or attached as separate files, carefully labelled in initial capital/lower case lettering with symbols in a form consistent with text use. Unnecessary background patterns, lines and shading should be avoided. Captions should be listed on a separate sheet. The resolution of digital images must be at least 300 dpi. All figures must be mentioned in the text.

• All articles should be preceded by an Abstract of between 100 and 200 words, giving a concise statement of the intention, results or conclusions of the article.

• For reference citations, please use APA style. Particular care should be taken to ensure that references are accurate and complete. Give all journal titles in full and provide DOI numbers where possible for journal articles.

• SI units must be used for all measurements, rounded off to practical values if appropriate, with the imperial equivalent in parentheses.

• In normal circumstances, effect size should be incorporated.

• Authors are requested to avoid the use of sexist language.

• Authors are responsible for acquiring written permission to publish lengthy quotations, illustrations, etc. for which they do not own copyright. For guidelines on editorial style, please consult the APA Publication Manualpublished by the American Psychological Association.

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11. The Later Stages

The corresponding author will receive an email alert containing a link to a web site. A working e-mail address must therefore be provided for the corresponding author. The proof can be downloaded as a PDF (portable document format) file from this site. Acrobat Reader will be required in order to read this file. This software can be downloaded (free of charge) from the following web site: http://www.adobe.com/products/acrobat/readstep2.html. This will enable the file to be opened, read on screen and annotated direct in the PDF. Corrections can also be supplied by hard copy if preferred. Further instructions will be sent with the proof. Hard copy proofs will be posted if no e-mail address is available. Excessive changes made by the author in the proofs, excluding typesetting errors, will be charged separately.

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Appendix B: Critical Appraisal Tool

1. Does the study address a clearly focused issue? (e.g. are hypotheses clearly defined?)
2. Did the authors use an appropriate methodology to answer their question?
3. Were the participants recruited in an acceptable manner? (e.g. are they a representative sample?)
4. Is the number of participants justified? (e.g. what is the effect size, is the sample under-powered?)
5. Is the control group a representative sample?
6. Is it clear how the data were collected?
7. Have the authors accounted for confounding factors in the design/analysis?
8. Is the method of analysis appropriate for the data type and research question?
9. Are the results of the study presented in a transparent way? (e.g. have they reported p-values, do they report all results)
10. Are the results reliable? (e.g. consider violations of normality, confidence intervals)
11. Was any missing data accounted for within the study?
12. Does the data justify the conclusions?
13. Are the results generalisable to the population studied? (is this discussed by the authors?)
14. Have the authors considered what the results add to the existing evidence base?

Appendix C: Data extraction table

	Critical Appraisal Question Number														Score
Article Reference:	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	
Pietrzak et al., 2011	2	2	0	1	N/A	2	0	2	2	1	1	2	0	2	17/26
Shea et al., 2016	2	2	2	2	N/A	2	0	2	2	0	2	2	1	2	21/26
Tripp et al., 2016	2	2	2	0	N/A	2	1	2	2	2	2	2	0	2	21/26
Maguen et al., 2009	2	1	0	2	N/A	2	2	2	2	1	0	2	0	1	17/26
Pitts et al., 2014	2	1	0	2	N/A	2	2	2	2	1	2	2	0	2	20/26
MacNair, 2002	2	2	2	2	2	2	2	2	1	1	0	2	0	0	20/28
Maguen et al., 2013	2	2	1	2	N/A	2	2	2	1	1	0	2	0	1	18/26
Maguen et al., 2010	2	1	2	2	N/A	2	2	2	2	1	2	2	0	1	21/26
Van Winkle & Safer, 2011	2	2	0	2	N/A	1	1	2	2	0	0	2	0	1	15/26
Goldstein et al., 2017	2	2	0	2	N/A	2	0	2	2	1	2	2	0	1	18/26

Key:

Yes (Y) = All evidence presented supports this item.

Partially (P) = There is insufficient or conflicting information to support this item

No (N) = The authors do not provide evidence for this item OR the evidence does not support this item.

Scoring:

Yes = 2

Partial = 1

No = 0

The role of PTSD, guilt and shame in predicting moral injury in veterans that have experienced active deployment.

This paper has broadly been prepared in accordance with the requirements of the Journal of Traumatic Stress.
Author Guidelines are listed in Appendix A.

Supplementary information is presented within this paper to aid overall cohesion for thesis submission; this will be removed prior to journal submission.

Word count: 7,995

Abstract

Moral injury is a relatively new concept which has been developed to account for the complexity of symptoms which are evident in military personnel but which go beyond the post-traumatic stress disorder (PTSD) diagnosis. Moral injury accounts for the intense negative emotions, such as guilt and shame which some military personnel experience following exposure to events which transgress their deeply held moral beliefs. This study investigated the role of PTSD, guilt and shame in predicting moral injury in a sample of ex-military personnel that had been exposed to active deployment. This was an internet-mediated research design; participants were recruited through an online social media site. British military veterans (n = 104) completed an online battery of self-report measures. Participants were male (n=99) and female (n=5) with a mean age of 47 years. Fifty-one percent of participants achieved scores on a measure of PTSD which would indicate a probable PTSD diagnosis. Guilt and shame were not predictors of moral injury. PTSD was the only significant predictor, accounting for 42% of the variance, with a medium effect size. Clinicians may find it useful to assess veterans for moral injury, particularly those presenting with PTSD. In order to provide detailed assessments it may be helpful for clinicians to further their own understanding of moral injury. Future research should look to establish an evidence base for psychological interventions for moral injury. Closer consideration of contributing factors, such as type of trauma and historical trauma is also needed to develop the construct of moral injury.

Key words: PTSD, moral injury, guilt, shame, military, veteran.

Introduction

Military veterans and PTSD

Military personnel leave the Armed Forces and return to civilian life for a variety of reasons. Due to advances in medical technology and improvements to armour, military personnel are surviving physical injuries and traumatic events sustained in combat that would have previously led to their death (Regan, 2004). However, it is not only the visible physical wounds of war that cause veterans difficulty, invisible wounds, such as post-traumatic stress disorder (PTSD) create casualties of a different kind (Tanielian, 2009). In 2016 the Ministry of Defence released a bulletin summarising all discharges across military services, within this it identified those discharged for mental health difficulties, including PTSD. Within the Royal Navy, being discharged for mental health difficulties accounted for 17% of all medical discharges, 22% of which were for PTSD. Within the Army, 21% of medical discharges were for mental health difficulties with 43% of these being for PTSD, and within the Royal Air Force mental health difficulties accounted for 28%, 24% of which were for PTSD (Ministry of Defence, 2016). PTSD was the highest contributor to all medical discharges for mental health difficulties.

Whilst the majority of veterans readjust back to civilian life without any problems (Tanielian, 2009) for those with PTSD, adjustment can be particularly difficult. The common PTSD symptoms of emotional numbness, withdrawal, hyper-vigilance and avoidance (Graf, Miller, Feist, & Freeman, 2011) result in difficulties with social functioning, productivity, community involvement and self-care (Sayer et al., 2010). PTSD is also commonly accompanied by symptoms of anxiety, depression and persistent hostility (Shalev, 2001). Rates of suicide have also been found to be elevated in male veterans with PTSD (Drescher, Rosen, Burling & Foy, 2003) however; the majority of literature around this is based on American veterans and may therefore not be transferable to a British population. All of these factors contribute to difficulties in adjustment, making it harder for veterans to return to civilian life and achieve a good quality of life. Many veterans also report returning to romantic and parental relationships, to be their main concern

(Rosenheck et al., 1992). Evidence suggests that those with PTSD experience more relationship problems, difficulties with intimacy, higher relationship distress, lower family cohesiveness and more difficulties parenting their children (Taft, Schumm, Panuzio & Proctor, 2008).

It is a concern, considering the difficulties UK veterans face, that only half of those with mental health problems seek help from the National Health Service (NHS) (NHS England, 2016). Evidence suggests this may in part be due to PTSD symptoms which often lead them to avoid social interaction or feel ashamed of their experiences, but also veterans' perceptions of how society will view them and the stigma associated with a mental health diagnosis (Mittal et al., 2013). The NHS has recently published clear recommendations for a more effective care pathway for veterans, which focuses on competent assessment and specialist interventions (Bashford, Hasan & Patel, 2016). The NHS emphasised the assessment of trauma and the need for accurate diagnosis; as pathways of care and referrals for treatment rely on this (Bashford et al., 2016). There is currently a lack of understanding about military-related trauma (Bashford et al., 2016), which supports the need for trauma focused research that explores the complexities of trauma and can subsequently inform clinical practice.

Theoretical models of PTSD

PTSD was first recognised as a diagnostic label in 1980 (Nemeroff et al., 2006). It has distinct clinical features which include repeated re-experiencing symptoms and physiological reactions to trauma related cues (Brewin, Dalgleish & Joseph, 1996). Re-experiencing symptoms may include nightmares or repetitive intrusive memories which can manifest as re-enactments of the original trauma, commonly known as 'flashbacks' (Brewin et al., 1996). These memories are often accompanied by a high level of distress and physiological arousal. The intrusive re-experiencing symptoms are characteristic of PTSD and are not found in other stress-related conditions (Brewin et al., 1996).

There are various theories of how PTSD develops, all of which are affiliated with one of the psychological models. The National Institute for Health and Care Excellence (NICE) guidelines in the United Kingdom (NICE, 2005) recommend Cognitive Behavioural Therapy (CBT) as one of the main interventions for PTSD. CBT is underpinned by a cognitive model of PTSD which helps us to understand how PTSD occurs. From a cognitive approach the processing of an event is important in that if a traumatic event or its sequelae is processed in a manner which produces a sense of serious threat to the individual, then developing PTSD is more likely (Ehlers & Clark, 2000). What all cognitive models assume is that individuals bring to the traumatic event a series of pre-existing beliefs and views of the world (Brewin et al., 1996). When the traumatic event is not compatible with these pre-existing beliefs, leading to a failure in information processing, partially processed traumatic information remains in active memory without being integrated. This can lead to a post-traumatic reaction such as PTSD (Brewin et al., 1996).

Military research has evolved to recognise that it is not solely fear based stressors, as was once traditionally thought (Currier, Holland & Malott, 2015), that could lead to the development of PTSD. Whilst fear based stressors, specifically threat to self, are still known to be a significant predictor of PTSD in British military personnel (Rona et al., 2012), research has found that PTSD symptoms can also exist in military populations where an individual's major stressor did not involve fear (Nash & Litz, 2013). It is recognised that there are many other factors which contribute to the development of PTSD in a military population; number of combat traumas (Tanielian, 2009) and gender (Booth-Kewley et al., 2013) are just a few examples. Female gender for example, has been shown to be a strong predictor of mental health outcomes in those returning from combat (Booth-Kewley et al., 2013). PTSD specifically, is evidenced at a higher rate in women than men (Nemeroff et al., 2006).

Combat is a unique experience whereby trauma exposure not only derives from direct conflict and fearing for one's safety, but can also occur when

personnel are faced with severe ethical and moral challenges (Litz et al., 2009). In these circumstances the major stressor is the moral decision making. Taking the life of a civilian being used by the enemy during a military operation, in order to save the lives of comrades, is one example of this (Maguen et al., 2011). The moral decision to knowingly take a civilian life may go against the individual's moral beliefs, but is necessary to save their comrades, as such this could result in emotions such as sadness and shame as opposed to fear. Results from a United States (US) survey of soldiers and Royal Marines serving in the Iraq War identified further moral dilemmas, including being responsible for the death of a non-combatant and witnessing wounded or ill women and children that they were unable to assist (Hoge et al., 2004). Military specific studies have found PTSD to correlate with events such as these, as well as participation in or witnessing atrocities and the loss of close friends (Currier & Holland, 2012). This highlights some of the unique and diverse contexts in which trauma may occur during combat.

Guilt and Shame in military PTSD

The Diagnostic and Statistical Manual (DSM-5) (American Psychiatric Association, 2013) recognises persistent guilt as a qualifying symptom for PTSD (Browne, Trim, Myers & Norman, 2015). Guilt is identified as a negative evaluation of a specific behaviour and is associated with remorse and regret over a perceived transgression (Tangney, Stuewig & Mashek, 2007). Research with veterans highlights that guilt is often accompanied by the belief that they should have acted, thought or felt differently based on their own internal set of standards about what is right and wrong (Kubany, 1994). When an individual feels guilty the focus remains on the action that they engaged in, they do not question their self-identity (Tangney, 1990) and are often led to seek out means of making amends (Gramzow & Tangney, 1992). A military example of an experience of guilt would be the troubling feeling that one survived where others did not (Leskela, Dieperink & Thuras, 2002). In this instance making amends is not possible therefore the potential for ongoing guilt is increased.

Shame, in contrast, involves a negative global evaluation of the core self that is commonly accompanied by feelings of worthlessness, powerlessness and vulnerability (Tangney et al., 2007). Whereas guilt involves a focus on the negative evaluation of one's own behaviour, shame involves the negative evaluation of the whole self (Leskela et al., 2002), and thus can result in the person's sense of self-identity being affected. A military example of shame would be an individual doubting their right to exist because others died where they did not (Leskela et al., 2002). Previous research has surmised that guilt is a less painful emotion (Leskela et al., 2002) and that shame is more damaging to the individual (Farnsworth, Drescher, Nieuwsma, Walser & Currier, 2014) because of its impact on the self and identity.

Experiencing guilt and shame can have significant effects on the mental health of veterans. Both emotions, for example, have been found to be associated with more severe PTSD among samples of Vietnam War veterans (Currier, Holland, Jones & Sheu, 2014). Guilt alone has been identified as a significant predictor of suicide risk in veterans with PTSD (Hendin & Pollinger Haas, 1991). Guilt and shame have also been identified as common emotions which veterans' report experiencing when they reflect on their own difficulties (Vargas, Hanson, Kraus, Drescher & Foy, 2013). Being prone to experiencing guilt and shame is something which individuals may bring with them when they enter military service, and therefore pre-existing factors cannot be ignored. Shame proneness has been shown to be a strong predictor of PTSD in veteran populations where guilt proneness was not (Leskela et al., 2002). Exploration of guilt and shame proneness and pre-existing factors, has received little attention in moral injury research.

Leskela et al. (2002) summarised that shame is important to understanding PTSD in veterans and should therefore be included in treatment planning; addressed through psychological interventions (Leskela et al., 2002). It has also been suggested that addressing guilt cognitions could be an important component in reducing PTSD symptoms in veterans when trauma-related guilt is present (Browne et al., 2015).

Lee, Scragg and Turner (2001) proposed a model of guilt and shame-based PTSD which may help to explain how these emotions are relevant to PTSD in a military population. The model is based on two possible pathways; *schema congruence* and *schema incongruence*. The meaning of the traumatic experience therefore either fits with existing schemas or beliefs the individual has about what is right or wrong (*congruence*) or it goes against these (*incongruence*). In either pathway the emotions of guilt or shame may occur in response to the meaning they attribute to the event. In differentiating shame from guilt-based PTSD further, Lee et al. (2001) identified that whilst the pathways may be the same for guilt and shame, shame requires a different therapeutic approach because it affects the sense of self and identity (Leskela et al., 2002).

A role for moral injury in guilt and shame based PTSD?

Moral injury is a relatively new concept in psychological practice and work with veterans (Dombo, Gray & Early, 2013); its conceptualisation originally deriving from soldiers' own accounts of having to betray moral codes and acting outside of their own moral beliefs (Tick, 2005). Often this is also referred to in literature as a 'transgressive act'. Litz et al. (2009) define moral injury as perpetrating, failing to prevent, bearing witness to or learning about acts that transgress deeply held moral beliefs and expectations. The concept has, therefore, developed from the assumption that all individuals, military and non-military, have internalised standards of ethical behaviour or schemas (Drescher et al., 2011).

Similarly it also seeks to explain why difficulties develop following events which inflict damage to moral belief systems rather than as a result of a fear based stressor (Nash & Litz, 2013). It is proposed that the discrepancy between an individual's existing schema and the morally injurious event creates an inner conflict (Dennis et al., 2017). The term 'moral injury' refers to the individual's inability to integrate the behaviour within their existing schema, due to the inner conflict, subsequent feelings of guilt or shame (Dennis et al., 2017), and their loss of trust in previously held beliefs (Nash & Litz, 2013). Essentially the term reflects an injury to the person's moral belief

system and their internal struggle to accept an ‘imperfect self’ (Currier et al., 2015). In this respect, the theoretical concept of moral injury is entwined with the negative affects of guilt and shame.

Those suffering from moral injury are said to experience a unique set of post-traumatic responses including, but not limited to, humiliation and sadness (Currier et al., 2015). It can impair and often destroy a veteran’s capacity for trust, their ideals and ambitions are questioned and as such often deteriorate, and attachments with others can change and become more distant (Shay, 2014). In addition veterans may experience spiritual problems, such as a loss of faith, and self-deprecation (Drescher et al., 2011).

Veterans may find that the moral choices they made during combat, which were acceptable within that context, are re-evaluated when back in civilian life and they struggle with self-forgiveness (Kopacz et al., 2015), although this may also depend on the individual and their environment. In particular, veterans who had experienced morally injurious events during deployment were shown to develop feelings of guilt and shame in relation to their actions (Currier et al., 2015), feelings which remained post-military service. There are veterans however, that will not have developed a moral injury, and it is not to suggest that for these individuals they do not feel guilt or shame about their actions, but they may have developed strategies in order to cope successfully with these feelings (Frankfurt & Frazier, 2016).

Studies have shown that morally injurious events during combat can act as stressors and are significantly associated with PTSD in military populations (Currier, McCormick & Drescher, 2015). Professionals working with veterans have identified that events involving betrayal, inappropriate or disproportionate violence, civilians, and within-ranks violence are most likely to result in moral injury (Drescher et al., 2011). As such, it is hypothesised in existing literature that moral injury is more likely to occur in the context of combat, particularly during more modern warfare such as that in the recent Iraq and Afghanistan War; where evolving military tactics have resulted in it being more difficult to differentiate civilians from enemies (Vargas et al.,

2013), and civilians are at greater risk of harm due to the close proximity of this style of combat (Nazarov et al., 2015). Findings from a study of 122 active duty personnel who were seeking treatment for PTSD found that many of the traumas they experienced pertained to morally injurious events (Stein et al., 2012).

As identified above, existing literature suggests that both guilt and shame are central to the development of moral injury. There is a close relationship between moral injury and PTSD, although evidence is conflicting for the relationship between guilt, shame and PTSD. Moral injury causes veterans significant difficulties, especially during and after their transition back to civilian life. The majority of literature is US based; however, rates of PTSD are reported as being higher in US military populations when compared to UK personnel (Iversen et al., 2008). There are also gender differences between the US and UK with women in the US being more likely to be engaged in front line duties (Iversen et al., 2008). These factors alone suggest that there are differences between serving personnel from the US and UK, and therefore research is not necessarily transferable. Research into British military and veterans populations is therefore crucial.

Whilst there is increasing research on moral injury it is still in its infancy. Further definitive evidence is needed to determine the psychological symptoms of moral injury. There is also little research on moral injury in military populations that distinguishes between guilt and shame (Farnsworth et al., 2014). The aim of this study was to extend what is known about the relationship between exposure to morally injurious events, feelings of guilt and shame, and PTSD in a sample of UK veterans. The specific hypothesis was that higher levels of guilt, shame and PTSD symptoms would predict moral injury. Age, gender, length of time in service and previous therapy were additional variables included in the analysis, as these were thought to be potentially confounding factors (as noted below). Older age, female gender, longer time in service and no previous therapy were all hypothesised to predict a greater degree of moral injury.

Method

Design

A cross-sectional design using internet-mediated research was used to quantitatively explore the research question. To determine the required sample size a power calculation using G*power (Faul, Erdfelder, Buchner & Lang, 2009) was completed. In order to achieve power of 0.80 (Cohen, 1992) with an alpha value of 0.05 for a medium effect size (0.15), 103 participants were required for regression analyses. A medium effect size was identified based on previous quantitative moral injury research (Currier et al., 2015).

Participants were asked in addition to report their age, gender, length of time in service and to disclose if they had had previous therapy for any symptoms which had occurred as a result of an experience they had had during their military service. These were additional predictor variables that were included within the analysis. Therapy was defined as five or more sessions with a mental health professional specifically to address psychological symptoms that had occurred as a result of an event the participant had experienced during active deployment. NICE guidelines (2005) state that five therapy sessions may be effective in reducing post-traumatic symptoms if therapy starts within the first month after a traumatic event (NICE, 2005). Therefore it was felt that if participants had previously had therapy this may impact on their reporting of symptoms, and as such was important to include as a variable within the regression model.

Length of time in service was coded as either 0-4 years or over 4 years. This was based on the minimum length of service as required by the British forces which is four years (ForcesWatch, 2011). Individuals remaining in the forces past four years were anticipated to have experienced a greater number of active deployments, and as such have been shown in previous research to be at higher risk of engaging in transgressive acts that fall both within (Frankfurt & Frazier, 2016) and outside of (Hiley-Young, Blake, Abueg, Rozynko & Gusman, 1995) the rules of engagement, subsequently increasing the risk of moral injury. It was therefore felt that this would be important to include as a variable within the regression analysis.

Epistemological Position

The researcher's epistemological position sits between a positivist and interpretivist approach. An interpretivist position assumes that reality is subjective, that it differs between individuals (Guba & Lincoln, 1994) and is constructed through language (Scotland, 2012). A positivist approach assumes that the world is external and objective (Easterby-Smith, Thorpe & Jackson, 1991) and therefore measurable. It is concerned with an objective truth, lending itself to the collection of large amounts of data and hypotheses testing (Easterby-Smith et al., 1991).

The research methodology for this project sits further toward a positivist approach due to its quantitative methodology which assumes that there is a truth that is observable and measurable. The researcher recognises and intentionally sought to adopt this approach in order to further their own knowledge and experience of quantitative methods as well as to further existing literature on moral injury outside of qualitative approaches. This method was also appropriate to the research question which considered predictors and was looking to investigate a relationship between variables. The method of data collection for this project, through closed question measures, therefore also sits within a positivist framework.

Participants

Participants were veterans that had previously served in the British Army, Royal Navy or Royal Air Force and had experienced active deployment. Active deployment was defined as being exposed to active war experience during military service. This criterion was applied to ensure that the participants were the most likely respondents to have experienced morally injurious events during their military service. Only those who served within the British forces (Royal Navy, Army, Royal Air Force) were eligible to take part, which ensured that the lived combat experience was reflective of those who served as part of the British forces only. Participants were both male (n=99) and female (n=5) with a mean age of 47 years (SD = 10.8; range = 19-71). The gender ratio is a little lower than that within the military, recent

statistics identify that women account for around 10% of current serving personnel (Dempsey, 2018). Fifty-one percent of participants met the criteria for PTSD. Participant demographics and descriptive statistics can be found in Table 1. Additional exclusion criteria were applied as follows: participants were excluded if they could not speak and read English due to a lack of translational resources, anyone under the age of 18 years was also excluded.

Table 1. Demographic data: Gender, Length of Service and Previous Therapy frequencies and percentage of sample.

		n	Percentage (%)
Gender	Male	99	95.2
	Female	5	4.8
Length of Service	0-4 years	4	3.8
	Over 4 years	100	96.2
Previous Therapy	Yes	36	34.6
	No	68	65.4

Procedure

Ethical approval was gained from Staffordshire University ethics committee (see Appendix B). Participants were recruited from the general population, through the social media site known as Facebook. Participant consent forms and an information sheet (see Appendix C) were included at the beginning of the online assessment battery. Participants had to click to record their consent to take part before they could access the questionnaire. Consent was obtained in line with Ethical Guidelines for Internet-mediated Research (British Psychological Society, 2013). This meant that the researcher ensured the following four principles were adhered to: respect for autonomy,

privacy and dignity of individuals and communities, scientific integrity, social responsibility and minimising harm. The data collection period ran from 1st February 2017 to the 30th November 2017 inclusive.

Advertisements for the project were in the form of a short 'post' (Appendix D) followed by a link advertised on the researcher's research page on social media. The link was made available for Facebook users to 'share' and formed the basis of a snowballing recruitment method, whereby those who shared the link were advertising to future possible participants amongst their acquaintances. The more the post was shared, the wider the sample of possible participants becomes. The link was also advertised through crowdsourcing, whereby the principal researcher shared the link on other Facebook pages and groups specific to veterans, PTSD and/or the military and where permission from the administrative representative was sought and given.

The online battery of questionnaires was accessed via a link on Facebook and hosted by the online survey software program called Qualtrics software, (Qualtrics, 2018) which is licensed for use by Staffordshire University. The questionnaire was anonymous in that no participant identifiable information was collected. Participants could complete the questionnaire at a time convenient to them and it took, on average, 10 minutes to complete.

Measures

All of the measures used were freely available online. Copies of each measure can be found in Appendix E.

Moral Injury Questionnaire – Military Version (MIQ-M; Currier, Holland, Drescher, & Foy, 2015).

This is a 19 item measure which assesses the frequency of exposure to morally injurious events. Questions include 'I did things in the war that betrayed my personal values', and 'There were times in the war that I saw/engaged in revenge/retribution for the things that happened'. Respondents rate their answers on a scale from 1 to 4 where 1 is *never* and

4 is *often*. The MIQ-M has been evaluated on a military population of 131 Iraq and/or Afghanistan veterans. Validity analyses revealed that higher scores (indicative of more morally injurious events) were correlated with greater combat exposure (*p* = .63), impairments in social/work functioning (*p* = .42), posttraumatic stress (p = .65) and depression (*p* = .39) (Currier et al., 2015), providing evidence for the validity of the measure. Analysis of reliability in the current study identified the MIQ-M as having a good (George & Mallery, 2003) level of internal consistency (α = .87).

PTSD Checklist – Military Version (PCL-M; Blanchard, Jones-Alexander, Buckley & Forneris, 1996).

The PCL-M is a 17 item self-report measure which assesses the 20 DSM-IV symptoms of PTSD. The PCL has been validated with a military population (McDonald & Calhoun, 2010). The PCL-M was chosen due to its specific focus on military experience, and so ensures that participants reflect on events which occurred during their military service. Questions include 'Suddenly acting or feeling as if a stressful military experience were happening again' and 'Repeated, disturbing memories, thoughts, or images of a stressful military experience from the past'. Respondents rate their answers on a five point scale where 1 is *not at all* and 5 is *extremely.* Higher scores indicate a greater severity of PTSD symptoms. All versions of the PCL checklist have shown good internal consistency, test-retest reliability and convergent validity (Wilkins, Lang & Norman, 2011. With a military population the PCL-5, which the PCL-M is derived from, was found to have a Cronbach's alpha value of .95 (Wortmann et al., 2016) and the PCL-M a kappa score of .64 (Weathers, Litz, Herman, Huska & Keane, 1993). Based on previous research the cut off score on the PCL-M for predicting a PTSD diagnosis is 50 (Leskela et al., 2002). This score was applied when considering the percentage of participants that would likely meet a diagnosis of PTSD. The PCL-M demonstrated an excellent (George & Mallery, 2003) level of internal consistency in the current study (α = .96).

Test of Self-Conscious Affect (TOSCA; Tangney, Wagner, & Gramzow, 1989).

The TOSCA is an 11 item measure which assesses guilt and shame across three subscales of shame self-talk, guilt self-talk and blaming others. The TOSCA has previously been used with a military population using only the shame and guilt subscales (Leskela et al., 2002). Items firstly give a scenario type question and then ask respondents to rate each of the three response choices on a Likert scale. For example; item 1 provides the following scenario 'you make plans to meet a friend for lunch. At five o'clock you realise you have stood your friend up'. Respondents are then asked to rate, on a scale from 1*'not likely'* to 5 *'very likely'*, each of the following possible responses: a) you would think 'I'm inconsiderate' b) you'd think you should make it up to your friend as soon as possible c) you would think 'my boss distracted me just before lunch'. Higher scores denote a greater propensity towards experiencing guilt/shame. Item analyses and confirmatory factor analyses of the TOSCA has shown to support the interpretation of the TOSCA as a measure of guilt and negative self-evaluation (Fontaine, Luyten, De Boeck & Corveleyn, 2001). Test re-test reliability values of 0.77 and 0.81 for shame and guilt respectively have been reported (Tangney, Wagner, Hill-Barlow, Marschall & Gramzow, 1996). Internal consistency scores for shame and guilt have been identified as .76 and .66 respectively (Gramzow & Tangney, 1992). In the current study the guilt subscale yielded an acceptable (George & Mallery, 2003) level of internal consistency (α = .71) as did the shame subscale (α = .75).

Data analysis

The analyses were conducted using the statistical software package SPSS version 25 for Windows (IBM Corporation, 2017). The data resulted in an overall score for each of the measures and subscales. There was no missing data and, therefore, all 104 participants' data were used in the initial analyses.

Prior to carrying out the regression analyses, the statistical assumptions required for regression were checked. These included normality, linearity and homoscedasticity. TOSCA Guilt was the only variable found to violate checks for normality, being positively skewed and with three significant outliers. A

Kolmogorov-Smirnov test was also run (see Appendix F). Overall, this suggested that the distribution of the sample differed significantly from a normal distribution (Field, 2005), and as such caution should be taken in interpreting the findings in relation to this variable. In response, the regression analyses were conducted with and without the outliers to determine the effect that the outliers had on the overall model (Appendix G), this made no difference to the precision of the model. The author also considered bootstrapping which is a re-sampling method that estimates confidence intervals for indirect effects and provides a sampling distribution in situations where a normal distribution is significantly violated (Mackinnon, Lockwood & Williams, 2004). Bootstrapping was performed on both multiple regressions, though, again, this made little difference to the model (Appendix H). Taking this into account, it was anticipated that the degree of violation could be handled by the robustness of the model.

Results

The mean, standard deviation and range for each variable can be found in Table 2.

Table 2. Descriptives for Criterion (MIQ-M) and Predictor Variables (PCL-M, TOSCA Guilt, TOSCA Shame) including mean, standard deviation (SD) and range.

	Mean	*SD*	*Minimum - Maximum*
MIQ-M	36.75	10.12	19 – 62
PCL-M	49.67	17.30	17 – 85
TOSCA Guilt	40.71	7.90	11 – 53
TOSCA Shame	30.61	9.15	12 - 53

Note: MIQ-M (Moral Injury Questionnaire – Military Version), PCL-M (PTSD Checklist – Military Version), TOSCA Guilt (Test of Self-conscious Affect – guilt subscale), TOSCA Shame (Test of Self-conscious affect – shame subscale).

As part of the regression analysis correlations among all of the variables were examined. It was anticipated that the variables which predicted moral injury would be more highly correlated with the criterion variable. Pearson's correlations between all of the variables can be found in Table 3. Moral injury (MIQ-M) was moderately positively correlated with PTSD (PCL-M) (r = .65). Therefore, as scores on the MIQ-M increase, so do scores on the PCL-M to a moderate degree. This may indicate that there is some overlap in terms of what these two measures are measuring. There was a very weak negative correlation between the TOSCA Guilt measure and the MIQ-M (r = -.06) and a weak positive correlation between the TOSCA Shame measure and the MIQ-M (r = .33); indicating no concerns that these variables were measuring the same thing.

Table 3. Pearson's correlation matrix for criterion, predictor and control variables: MIQ-M, PCL-M, TOSCA Guilt, TOSCA Shame, Age, Gender, Length of Service and Previous Therapy

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1.MIQ-M	-							
2.Age	-.14	-						
3.Gender	.12	-.27	-					
4.Length of Service	-.14	.25	-.19	-				
5.Previous Therapy	-.32	-.03	.16	-.04	-			
6.PCL-M	.65**	-.06	.08	-.08	-.48	-		
7.Guilt	-.06*	-.10	.13	-.03	-.05	.09	-	
8.Shame	.33	-.16	.22	-.03	-.02	.44	.44	-

* $p < 0.05$

** $p < 0.01$

Note: MIQ-M (Moral Injury Questionnaire – Military Version), Age (years), Gender (male, female or other), Length of service (0-4 or over 4 years), Previous therapy (yes or no), PCL-M (PTSD Checklist – Military Version), TOSCA Guilt (Test of Self-conscious Affect – Guilt subscale), TOSCA Shame (Test of Self-conscious affect – shame subscale).

A standard multiple regression analysis was conducted with all variables being added to the model. Predictor variables were PCL-M, TOSCA Guilt and TOSCA Shame. Criterion variable was MIQ-M with the following demographic variables also being included to explore any confounding effect: age, gender, length of service and previous psychological therapy.

Regression coefficients for the dependant and predictor variables can be found in table 4.

Table 4. Multiple regression model for predictors of MIQ-M: Age, Gender, Length of Service, Previous Therapy, PCL-M, TOSCA Guilt, TOSCA Shame. Standard and un-standardised coefficients, significance values and confidence intervals.

	B	*SE B*	*β*	*Sig.*	*95% CI*	
					Lower	*Upper*
Constant	36.92	11.38		.002	14.32	59.51
Age	-.07	.08	-.08	.324	-.22	.07
Gender	2.01	3.79	.04	.597	-5.51	9.53
Length of Service	-3.99	4.08	-.08	.330	-12.10	4.11
Previous Therapy	-1.32	1.91	-.06	.491	-5.12	2.47
PCL-M	.33	.06	.56	.001	.21	.45
TOSCA Guilt	-.24	.11	-.19	.028	-.46	-.03
TOSCA Shame	.16	.11	.14	.156	-.06	.37

Note: R^2 = .47; Adjusted R^2 = .43

PTSD (PCL-M) and guilt (TOSCA Guilt) were significant predictors of moral injury (MIQ-M). This model accounted for 47% (R^2) of the variance, 43.1% (R^2 Adjusted). Age, Gender, Length of Service, Previous Therapy and TOSCA Shame did not predict moral injury. The regression model was re-run with only the significant predictors in order to improve the precision of the

model. Regression coefficients for the significant predictors and dependant variable are reported in table 5.

Table 5. Multiple regression model for significant predictors of MIQ-M: PCL-M and TOSCA Guilt. Standard and un-standardised coefficients, significance values and confidence intervals.

	B	*SE B*	β	*Sig.*	95% CI	
					Lower	Upper
Constant	23.64	4.37		.000	14.98	32.31
PCL-M	.39	.04	.66	.001	.30	.47
TOSCA Guilt	-.15	.10	-.12	.12	-.34	.04

Note: R^2 = .44; Adjusted R^2 = .43

When running the regression model with only the significant variables (PCL-M and TOSCA Guilt) in order to improve precision of the mode, PCL-M was a significant predictor of moral injury (MIQ-M), whereas TOSCA Guilt was no longer significant. This model accounted for 44% (R^2) of the variance, 43% (R^2 Adjusted). In order to further improve the precision of the final model the regression was run again with only PCL-M as a predictor variable and MIQ-M as the criterion. Regression coefficients for the significant predictors and dependant variable are reported in table 6.

Table 6. Multiple regression model for significant predictor of MIQ-M: PCL-M. Standard and un-standardised coefficients, significance values and confidence intervals.

	B	*SE B*	β	*Sig.*	95% CI	
					Lower	Upper
Constant	17.84	2.32		.000	13.25	22.43
PCL-M	.38	.04	.65	.000	.29	.47

Note: R^2 = .42; Adjusted R^2 = .42

Thus, in the final model, PTSD (PCL-M) was the only significant predictor of moral injury (MIQ-M). This final model accounted for 42% (R^2) of the variance, 42% (R^2 Adjusted). Evidence from other quantitative studies investigating theories of moral injury have reported models accounting for 35% (R^2) of the variance, 13% (R^2 Adjusted) (Bryan, Bryan, Morrow, Etienne, & Ray-Sannerud, 2014). In comparison this suggests that PTSD is a strong variable in this relationship.

Discussion

Summary of findings

The aim of the current study was to investigate the construct of moral injury and its relationship with PTSD and feelings of guilt and shame. The specific hypothesis tested was that PTSD, guilt and shame would be significant predictors of moral injury in military veterans that had experienced active deployment. The findings indicated that PTSD was a significant predictor of moral injury, as predicted. This finding is consistent with previous literature which identifies a relationship between PTSD and moral injury (Currier et al., 2015; Drescher et al., 2011). Interestingly the hypotheses that guilt and

shame would predict moral injury was not supported, this was surprising given the findings from previous qualitative research which identifies guilt and shame as emotions central to the development and identification of a moral injury (Currier et al., 2015; Dennis et al., 2017).

This was the first study to investigate PTSD and moral injury through this methodology in a British veteran population. Investigation into the concept of moral injury across cultures has previously been identified as a direction for future research (Allenby & Frame, 2017). The findings of this study provide support to the relationship between PTSD and moral injury, previously evidenced in US populations (Currier et al., 2015). The findings also further what is known about the relationship between PTSD and moral injury across nations, demonstrating a consistent finding in a British veteran sample. This would suggest that the literature on moral injury and PTSD may be transferable between the US and the UK, despite variations in PTSD which exist between these two nations (Richardson, Frueh & Acierno, 2011). However, the findings in this study would suggest that such factors may not be important when considering the relationship between PTSD and moral injury across nations.

There was a moderate correlation between the measure of moral injury and the measure of PTSD, which is to be expected given the significant relationship. Whilst this may reflect some of the cross-over in symptoms that are said to be evident in both moral injury and PTSD (Currier et al., 2015), the final regression model accounted for 42% (R^2 Adjusted) of the variance which is quite high for one variable when compared to other studies which have investigated moral injury (Bryan et al., 2014). This would indicate that PTSD is an important factor. However, it is acknowledged that 58% of the variance is not explained by this model and therefore additional variables, not accounted for in this research, are likely to be involved. It has been hypothesised previously that the type of traumatic event can have an influence on the course of PTSD development and subsequent psychological sequelae in veterans (Jakob, Lamp, Rauch, Smith & Buchholz, 2017). Given the close relationship between PTSD and moral injury it is possible that the

type of traumatic event is also relevant to moral injury. This was not measured or captured in the data in this study and therefore it is not possible to say with certainty, but it could be that this is one of the variables accounting for the unexplained variance in this model.

Previous research into moral injury predominantly does not differentiate between shame and guilt (Farnsworth et al., 2014). This study considered shame and guilt as separate variables with their own measures, which yielded results whereby guilt was significant in the first regression model but shame was not. There was a clear difference between the two variables in terms of their levels of significance as predictors which provides further evidence for the need to continue assessing guilt and shame as separate emotions. As precision of the model was improved guilt was no longer significant, indicating that in isolation guilt is not a significant predictor of moral injury. Existing research is conflicting on the relationship between PTSD, guilt and shame in veteran populations, with some finding a significant positive relationship (Crocker, Haller, Norman & Angkaw, 2016; Dekel, Mamon, Solomon, Lanman & Dishy, 2016; Andrews, Brewin, Stewart, Philpott & Hejdenberg, 2009) and others finding no significant relationship (Browne et al., 2015; Leskela et al., 2002). It is queried whether the findings of this study reflect a wider question about the conflicting evidence found only in quantitative research, around the role of guilt and shame in veteran's mental health difficulties.

Moral injury was developed to explain the shame and guilt based disturbances that some veterans experience (Frankfurt & Frazier, 2016). Another explanation for the findings in this study could be located in how shame and guilt are measured. The TOSCA measures shame and guilt proneness based on everyday situations that might be faced by a civilian population. It is thus not specific to combat situations, although it has been used with military samples previously (Leskela et al., 2002), and supported as a measure of guilt and negative self-evaluation (Fontaine et al., 2001). There is also no existing measure of guilt and shame specific to military populations. On reflection, the TOSCA does not ask specifically about an

event experienced during deployment, the measure is more global than this and asks about everyday scenarios. From this perspective, the TOSCA may not be sensitive and specific enough as a measure to be able to state with certainty that the veterans in this study were experiencing guilt or shame related to morally injurious events. What the findings do infer is that for the veterans with PTSD and moral injury in this sample, they were not prone to experiencing guilt and shame based on an assessment of everyday scenarios.

This study was internet-based research which may have increased the validity of the results. Previous literature identifies that internet-mediated research removes interviewer bias as the researcher is not present or involved in the collection of the data (Selm & Jankowski, 2006). Therefore participants are more likely to provide responses that are valid as they are free to express themselves and their own viewpoints (Padayachee, 2016).

Clinical implications

The findings of this research support the notion that moral injury can be present in a combat veteran population, therefore suggesting that when working with military veterans who have PTSD, clinicians may find it helpful to also assess for moral injury. In addition it may be relevant to consider whether existing psychological interventions successfully address the unique set of post-traumatic responses evident with moral injury (Currier et al., 2015). Supporting veterans with their recovery from moral injury would require consideration of their moral values that have been transgressed through combat experiences. In particular, Acceptance and Commitment Therapy (ACT) provides a psychological approach that invites the exploration of values (Nieuwsma, Walser, Farnsworth, Drescher, Meador & Nash, 2015), which may be beneficial for professionals to consider when working with moral injury and supporting veterans to re-gain a meaningful and values-based life. The principles of ACT have previously been identified as being relevant to the therapeutic approach to moral injury, although its efficacy and effectiveness have yet to be investigated (Nieuwsma et al., 2015). Collecting baseline data through psychometric measures aimed at identifying the

psychological symptoms of moral injury, and repeating these as part of the therapeutic evaluation process, could provide information as to the effectiveness of psychological interventions.

One of the clear recommendations from NHS England is that competent assessments and specialist interventions should be developed based on evidence-based practice (Bashford et al., 2016). In order to be able to assess for moral injury it may help clinicians to firstly develop their awareness of moral injury and to have an understanding of the presenting symptoms that may be indicators of its presence. This may be done through accessing existing research, through training or carrying out research in this area. By exposing themselves to developments in the field of military and veteran psychology clinicians can ensure they are best informed and therefore delivering evidence-based psychological interventions.

The findings of this study indicate that other variables are involved in the relationship between PTSD and moral injury. It is beyond the scope of this study to conclude what these other factors are however, clinicians may benefit from remaining open to investigating this and incorporating a wide range of factors in their assessments. Particularly when assessing veterans presenting with PTSD, it might be of benefit to consider the type of trauma that they have experienced (Jakob et al., 2017). This may be done through semi-structured interviews at the psychological assessment phase.

Limitations

PTSD was shown to be a predictor of moral injury however; due to the cross-sectional design of this study it is not possible to determine causality, given this study was not designed to test such an assumption. The data was collected during one specific time frame in a participant's life; with no baseline data to compare to. It is a limitation of this study therefore, that it is not possible to determine whether symptoms of either PTSD or moral injury existed prior to the combat experience. Without baseline data and a detailed history of each participant it is also not possible to infer whether the symptoms reported were due to combat experiences and not present before

active service. This does, however, identify some of the difficulties in furthering the concept of moral injury and being able to fully differentiate moral injury from combat related PTSD and combat related symptoms from pre-existing factors.

The participants in this study were combat veterans, recruited with the intention to investigate the studied variables in a combat veteran population because they are more likely to have experienced morally injurious situations during their military service. However, as the study was internet-mediated research and used a social media site to collect the data, it was reliant on participants self-identifying that they correctly met the inclusion criteria. Anyone with access to Facebook could have completed the questionnaire which means there was little control over the recruited sample which may have affected the sampling process (Selm & Jankowski, 2006). As such the participants in this sample are unverified.

On reflection there were additional variables, relevant to the development of PTSD in veterans, which may have been important to include as part of the regression model, however, it was beyond the scope of this research to include all possible predictor variables. Previous research has identified that the type of traumatic event is one factor involved in the development of PTSD and associated symptoms (Shea, Presseau, Finley, Reddy & Spofford, 2016). It is recognised that veterans could have been exposed to multiple events during deployments, all of which may be different types of combat (Shea et al., 2016). Type of trauma, therefore, may have been a significant, and thus an important variable to consider, but identifying which event was responsible for the subsequent symptoms of moral injury or PTSD would be difficult. Sexual trauma in particular, has been identified as having a strong link with both PTSD and feelings of guilt and shame among serving military personnel (Nazarov et al., 2015). In a US study of veterans accessing healthcare, 20% of females and 1% of males reported having experienced at least one incident of military sexual trauma during their service (Department of Veterans Affairs MST Support Team, 2008).

Directions for Future Research

Little is known about the development of moral injury over time; this research is unable to infer whether moral injury existed pre or post PTSD, or whether the relationship developed concurrently. When transitioning back to civilian life, veterans also face a complex cultural transition (Cooper, Caddick, Godier, Cooper & Fossey, 2016) which involves a shift from the military norms and values to those of society (Thompson et al., 2016). The values of society may not support some of the experiences veterans faced during combat, which could result in an increasing inner conflict over time. Potentially this conflict may lead to a moral injury as veterans move towards adopting the values of the society in which they now live and the realisation of previous events and the incompatibility with societal norms. As such it would be relevant for future research to consider the role of transition and societal values in the development of moral injury using a longitudinal research design.

An improved understanding of the moral injury construct would offer greater insight into what is needed to develop and provide psychological interventions that successfully address all of the needs of veterans. This research identified that moral injury (as measured by the MIQ-M) is different to PTSD (as measured by the PCL-M) and thus PTSD interventions may not fully target the needs of veterans with a moral injury. Additional research should consider pre- and post-intervention measures to establish an evidence base for psychological interventions. Future research should also consider what other variables may be pertinent to include, for example, previous trauma and type of traumatic event.

Conclusion

Despite the limitations, this study has provided further evidence in support of the relationship between PTSD and moral injury. The findings indicated that PTSD was a significant predictor of moral injury in British veterans that had experienced combat deployment. However, guilt and shame were not significant predictors. This finding is consistent with previous literature which

identifies a relationship between PTSD and moral injury (Drescher et al., 2011), although it is surprising that guilt and shame were not significant predictors of moral injury. Moral injury is currently still in its infancy as a construct (Dombo et al., 2013) and further research is needed to develop a thorough understanding of its psychological sequelae and development over time. This research may provide evidence for further consideration of how to approach the investigation of moral injury in veterans. Clinicians working with veterans with PTSD may find it helpful to consider whether the individual is also suffering from a moral injury and subsequently consider this when planning psychological interventions.

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Appendix A: Author guidelines for the Journal of Traumatic Stress

Author Guidelines

1. **Online Submissions:** The *Journal of Traumatic Stress* accepts submission of manuscripts online at: http://mc.manuscriptcentral.com/jots Information about how to create an account or submit a manuscript may be found online on the Manuscript Central homepage in the "User Tutorials" section or, on the Author Dashboard, via the "Help" menu in the upper right corner of the screen. Personal assistance also is available by calling 434-964-4100.

2. **Article Formats:** Three article formats are accepted for consideration by JTS. All page counts should include references, tables, and figures. *Regular articles* (30 pages maximum, inclusive of all text, abstract, references, tables, and figures) include research studies, quantitative systematic reviews, and theoretical articles. Purely descriptive articles or narrative-based literature reviews are rarely accepted. In extraordinary circumstances, the editors may consider longer manuscripts that describe highly complex designs or statistical procedures but authors should seek approval prior to submitting manuscripts longer than 30 pages. *Brief reports* (18 pages maximum) are appropriate for pilot studies or uncontrolled trials of an intervention, preliminary data on a new problem or population, condensed findings from a study that does not merit a full article, or

methodologically oriented papers that replicate findings in new populations or report preliminary data on new instruments. *Commentaries* (1,000 words or less) involve responses to previously published articles or, occasionally, invited essays on a professional or scientific topic of general interest. Response commentaries, submitted no later than 8 weeks after the original article is published (12 weeks if outside the U.S.), must be content-directed and use tactful language. The original author is given the opportunity to respond to accepted commentaries.

3. **Double-Blind Review:** As of January 1, 2017, the Journal of Traumatic Stress utilizes a double-blind review process in which reviewers receive manuscripts with no authors' names or affiliations listed in order to ensure unbiased review. To facilitate blinded review, the title page should be uploaded as a separate document from the body of the manuscript, identified as "Title Page," and should include the title of the article, the running head (maximum 50 characters) in uppercase flush left, author(s) byline and institutional affiliation, and author note (see pp. 23-25 of the APA 6th ed. manual). Within the main body of the manuscript, tables, and figures, authors should ensure that any identifying information (i.e., author names, affiliations, institutions where the work was performed, university whose ethics committee approved the project) is blinded; a simple way to accomplish this is by replacing the identifying text with the phrase "[edited out for blind review]". In addition, language should be used that avoids revealing the identity of the authors; e.g., rather than stating, "In other research by our lab (Bennett & Kerig, 2014), we found …" use phrases such as, "In a previous study, Bennett and Kerig (2014) found …" Please note that if you have uploaded the files correctly, you will **not** be able to view the title page in the PDF and HTML proofs of your manuscript; however, the Editor and JTS editorial office staff can view this information.

4. **Preferred and Non-Preferred Reviewers:** During the submission process, authors may suggest the names of preferred reviewers; authors also may request that specific individuals not be selected as reviewers.

5. **Publication Style:** JTS follows the style recommendations of the 2010 *Publication Manual of the American Psychological Association* (APA; 6th edition) and submitted manuscripts must conform to these formatting guidelines. Manuscripts should use non-sexist language. Manuscripts must be formatted using letter or A4 page size, with 1 inch (2.54 cm) margins on all sides, Times

New Roman 12 point font (except for figures, which should be in 12 point Arial font), and double-spacing for text, tables, references, and figures. Submit your manuscript in .doc or .docx format. For assistance with APA style, in addition to consulting the manual itself, please note these helpful online sources that are freely available: http://www.apastyle.org/learn/tutorials/basics-tutorial.aspx and https://owl.english.purdue.edu/owl/section/2/10/.

6. **APA and JTS Style Pointers:** In addition to consulting the APA 6th edition Publication Manual, the resources indexed above, and the JTS Style Sheet posted online, please consider these pointers when formatting each section of the manuscript:

    a. **Tense:** Throughout the manuscript, please use past tense for everything that has already happened, including the collection and analyses of the data being reported.

    b. **Abstract:** The Main Document of the manuscript should begin with an abstract no longer than 250 words, placed on a separate page. In addition, JTS house style requires the reporting of an effect size for each finding discussed in the abstract; if there are many findings, present the range.

    c. **Participants:** Please include in this subsection of the Method section information on sample characteristics, subsample comparisons, and analyses that describe the sample but are not focused on testing the hypotheses that are the aims of your manuscript.

    d. **Procedure:** Please describe the procedure in sufficient detail so that it could be comprehended and replicated by another investigator. Identify by name the IRB or ethics committee (edited out for blind review in the submitted manuscript) that approved the research, and the manner in which consent was obtained.

    e. **Measures:** In addition to providing citations, psychometric, and validation data for each measure administered, please provide coefficient alpha from your data for each measure for which this is appropriate.

    f. **Data Analysis:** Include a separate subsection with this header in the Method section in which you describe the analyses performed, the software program(s) used, and make an explicit statement about missing data in your data set. If there are no missing data, so state; otherwise describe the extent of missing data and how they were handled in the data analyses.

    g. **Results** (and throughout): Present percentages to 1 decimal place, means and *SD*s to 2 decimal places, and exact *p* values to 3 decimal places

except for any < .001. Include leading zeros (e.g., 0.92) when reporting any statistic that can be greater than 1.00 (or less than -1.00). For example, there is no leading zero used when reporting correlations, coefficient alphas, standardized betas, *p* values, or fit indices (e.g., *r* = .47, not 0.47). Report effect sizes for analyses conducted wherever possible and appropriate.

h. **References:** Format the references using APA 6th edition style: (a) begin the reference list on a new page following the text, (b) double-space, (c) use hanging indent format, (d) italicize the journal name or book title, and (e) list alphabetically by last name of first author. Do not include journal issue numbers unless each volume begins with page 1. If a reference has a Digital Object Identifier (doi), it must be included as the last element of the reference.

(1) ***Journal Article:***

Kraemer, H. C. (2009). Events per person-time (incidence rate): A misleading statistic? *Statistics in Medicine, 28*, 1028–1039. doi: 10.1002/sim.3525

(2) ***Book:***

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

(3) ***Book Chapter:***

Meehl, P. E. (2006). The power of quantitative thinking. In N. G. Waller, L. J. Yonce, W. M. Grove, D. Faust, & M. F. Lenzenweger (Eds.), *Essays on the practice of scientific psychology* (pp. 433–444). Mahwah, NJ: Erlbaum.

i. **Footnotes:** Footnotes should be avoided. When their use is absolutely necessary, footnotes should be formatted in APA style and placed on a separate page after the reference list and before any tables.

j. **Tables:** Tables should be formatted in APA 6th edition style and should be placed after the references in the body of the manuscript. Please use Word's Table function to construct tables, not tabs and spacing. Tables should be numbered (with Arabic numerals) and referred to by number in the text. Each table should begin on a separate page. Please make tables double-spaced, decimal align all numeric columns, and use sentence case for labels. Each datum should appear in its own cell (e.g., do not include *SDs* in parentheses

following *M*s but instead create a separate column for *SD*s). When reporting a table of intercorrelations, fill the rows first and then the columns such that any empty cells are in the lower left-hand quadrant of the table; use dashes in any redundant cells indicating the correlation of a variable with itself. Report exact *p* values to three decimal places (e.g., $p = .043$) wherever possible; however, if doing so would make the table unruly (e.g., in a table of intercorrelations), it is permissible to use asterisks to indicate p values at the traditional cut-off points (e.g., * $p < .05$. ** $p < .01$. $p < .001$).

Color in tables: Color can be included in the online version of a manuscript at no charge; however use of color in the print version of the journal will incur additional charges (currently $600 per figure or table). If you wish to include color in only the online version, please ensure that each table will be legible in greyscale when it is published in the print version; for example, lines of different colors may be discriminable from one another when viewed in color but may not appear to be different from one another in greyscale.

k. **Figures:** All figures (graphs, photographs, drawings, and charts) should be numbered (with Arabic numerals) and referred to by number in the text. Each figure should begin on a separate page. Place figures captions at the bottom of the figure itself, not on a separate page. Include a separate legend to explain symbols if needed. Please use Arial font throughout except for the caption, which should remain as Times New Roman. Use sentence case for titles and labels. Figures should be in Word, TIF, or EPS format.

Color in figures: Color can be included in the online version of a manuscript at no charge; however use of color in the print version of the journal will incur additional charges (currently $600 per figure or table). If you wish to include color in only the online version, please ensure that each figure will be legible in greyscale when it is published in the print version; for example, lines of different colors may be discriminable from one another when viewed in color but may not appear to be different from one another in greyscale.

7. **Uploading Files:** After the separate Title Page has been uploaded as a Word file (.doc or .docx), the remaining text (abstract, main body of the manuscript, references, and tables) should be uploaded as a separate **single** Word file (.doc or .docx) designated as “Main Document.” Figures may be either included in the main document or uploaded as separate files if in a non-Word format.

8. **Supplementary Materials.** Authors may wish to place some material in the separate designation of “Supplementary file not for review,” which will be made available online for optional access by interested readers. This material will not be seen by reviewers and will not be taken into consideration in their evaluation of the scientific merits of the work, and will not be included in the published article. Material appropriate for such a designation includes information that is not essential to the reader’s comprehension of the study design or findings, but which might be of interest to some scholars; examples might include descriptions of a series of non-significant post-hoc analyses that were not central to the main hypotheses of the study, detailed information about the content of coding system categories, and CONSORT flow diagrams for randomized controlled trials (see below). Note well that the manuscript must stand on its own without this material; consequently, critical information reviewers and readers need to evaluate or replicate the study, such as the provenance and psychometric properties of the measures administered, is not appropriate for placement into Supplementary Materials.

9. **Statement of Ethical Standards:** In the conduct of their research, author(s) are required to adhere to the "Ethical Principles of Psychologists and Code of Conduct" of the American Psychological Association (visit http://www.apa.org/science/leadership/research/ethical-conduct-humans.aspx for human research or http://www.apa.org/science/leadership/care/guidelines.aspx for animal research) or equivalent guidelines in the study's country of origin. If the author(s) were unable to comply when conducting the research being presented, an explanation is required.

   All work submitted to the *Journal of Traumatic Stress* must conform to applicable governmental regulations and discipline-appropriate ethical standards. Responsibility for meeting these requirements rests with all authors. Human and animal research studies typically require prior approval by an institutional research or ethics committee that has been established to protect the welfare of human or animal participants.

   Data collection for the purposes of providing clinical services or conducting an internal program evaluation generally does not require approval by an institutional research committee. However, analysis and presentation of such data outside the program setting may qualify as research (which is defined as an

effort to produce generalizable knowledge) and thus may require approval by an institutional committee. Those who submit manuscripts to the *Journal of Traumatic Stress* based on data from these sources are encouraged to consult with a representative of the applicable institutional committee to determine whether approval is needed. Presentations that report on a particular person (e.g., a clinical case) also usually require written permission from that person to allow public disclosure for educational purposes, and involve alteration or withholding of information that might directly or indirectly reveal identity and breach confidentiality.

To document how these guidelines have been followed, authors are asked to identify in the online submission process the name of the authorized institution, committee, body, entity, or agency that reviewed and approved the research or that deemed it to be exempt from ethical or Internal Review Board review. Although blinded at the time of submission, the name of the IRB or ethics committee that approved the research, and the manner in which consent was obtained, also should appear in the Procedure subsection of the Method in the body of the report.

10. **Randomized Clinical Trials:** Reports of randomized clinical trials should include a flow diagram and a completed CONSORT checklist (available at http://www.consort-statement.org) indicating how the manuscript follows CONSORT Guidelines for the reporting of randomized clinical trials. The flow diagram should be included as a figure in the manuscript whereas the checklist should be designated as a "Supplementary file not for review" during the online submission process. Please visit http://consort-statement.org for information about the consort standards and to download necessary forms.

11. **Systematic Reviews:** Reports of systematic reviews follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (http://www.prisma-statement.org/documents/PRISMA%202009%20checklist.pdf) and should be accompanied by a flow diagram (http://www.prisma-statement.org/PRISMAStatement/FlowDiagram.aspx) mapping out the number of records identified, included, and excluded, and the reasons for exclusions.

12. **Writing for an International Readership:** As an international journal, the *Journal of Traumatic Stress* avoids the use of operational code names or nicknames to describe military actions, wars, or conflicts, given that these may not be equally familiar or meaningful to readers from other nations. Helpful guides for clear and neutral language for reporting on military-based research can be found at the following webpages: the ISTSS newsletter *StressPoints* (http://www.istss.org/education-research/traumatic-stresspoints/2015-march-(1)/media-matters-what%E2%80%99s-in-a-name-using-military-code.aspx)*, the International Press Institute* (http://ethicaljournalismnetwork.org/assets/docs/197/150/4d96ac5-55a3396.pdf) and the *Associated Press Stylebook and Briefing on Media Law* (http://www.apstylebook.com/?do=help&q=48/). In addition, authors are encouraged to give consideration to whether particular research findings might be culturally-specific rather than universally established; e.g., prevalence rates derived from samples consisting of all-US participants should be identified as such.

13. **Originality and Uniqueness of Submissions.** Submission is a representation that neither the manuscript nor substantive content within in it has been published previously nor is currently under consideration for publication elsewhere. A statement transferring copyright from the authors (or their employers, if they hold the copyright) to the International Society for Traumatic Stress Studies will be required after the manuscript has been accepted for publication. Authors will be prompted to complete the appropriate Copyright Transfer Agreement through their Author Services account. Such a written transfer of copyright is necessary under U.S. Copyright Law in order for the publisher to carry through the dissemination of research results and reviews as widely and effectively as possible.

14. **Pre-Submission English-Language Editing:** Authors for whom English is a second language may choose to have their manuscript professionally edited before submission to improve the English. Japanese authors can find a list of local English improvement services at http://www.wiley.co.jp/journals/editcontribute.html. All services are paid for and arranged by the author, and use of one of these services does not guarantee acceptance or preference for publication.

15. **Page Charges:** The journal makes no page charges. The only exception to this, as noted above, is if authors wish tables or figures to be printed in color.
16. **Author Services:** Online production tracking is available for your article through Wiley-Blackwell's Author Services. Author Services enables authors to track their article—once it has been accepted—through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated emails at key stages of production. Authors will receive an email with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete email address is provided when submitting the manuscript. Visit http://authorservices.wiley.com/ for more details on online production tracking and for a wealth of resources including FAQs and tips on article preparation, submission, and more. Corresponding authors: In lieu of a complimentary copy free access to the final PDF offprint of your article will be available via Author Services only. Please therefore sign up for Author Services if you would like to access your article PDF offprint and enjoy the many other benefits the service offers. Should you wish to purchase reprints of your article, please click on the link and follow the instructions provided: https://caesar.sheridan.com/reprints/redir.php?pub=10089&acro=JTS
17. **OnlineOpen** : The *Journal of Traumatic Stress* accepts articles for Open Access publication. Please visit http://olabout.wiley.com/WileyCDA/Section/id-828081.html for further information about OnlineOpen.
18. **NIH Public Access Mandate:** For those interested in the Wiley-Blackwell policy on the NIH Public Access Mandate, please visit our policy statement at www.wiley.com/go/nihmandate

Appendix B: Ethical approval documents

Faculty of Health Sciences

ETHICAL APPROVAL FEEDBACK

Researcher name:	Vicky Aldridge
Title of Study:	Investigating Moral Injury, PTSD, guilt and shame in ex-military persons that have experienced active deployment.
Status of approval:	Approved

Thank you for addressing the committee's comments. Your research proposal has now been approved by the Faculty's Ethics Panel and you may commence the implementation phase of your study. You should note that any divergence from the approved procedures and research method will invalidate any insurance and liability cover from the University. You should, therefore, notify the Panel of any significant divergence from this approved proposal.

You should arrange to meet with your supervisor for support during the process of completing your study and writing your dissertation.

When your study is complete, please send the ethics committee an end of study report. A template can be found on the ethics BlackBoard site.

Signed: Dr Peter Kevern **Date: 18.1.17**
Chair of the Faculty of Health Sciences Ethics Panel

Appendix C: Participant information sheet and consent form

Study Information

Investigating moral injury, PTSD, guilt and shame in ex-military persons that have experienced active deployment.

Lead Researcher: Vicky Aldridge

Invitation and brief summary

Have you served in the UK armed forces?
Have you been on deployment?
Are you over the age of 18?

If the answer is yes then you are invited to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully. Talk to others about the study if you wish.

(Part 1 tells you the purpose of the study and what will happen to you if you take part. Part 2 gives you more detailed information about the conduct of the study)

Please contact the lead researcher via email or telephone if there is anything that is not clear or if you would like more information prior to taking part in the study. Take time to decide whether or not you wish to take part.

Part 1

What is involved?

The impact of war and deployment on military servicemen has become a key topic of interest. There is a lot of research on Posttraumatic Stress Disorder (PTSD) which is often assumed to be the main cause of difficulties that ex-military persons experience. This research is interested in a fairly new concept, coined ‘moral injury’.

Moral injury refers to the emotional effect on soldiers of actions taken as part of their military role. We also know that some military persons may have feelings of guilt and shame as a result of events they have witnessed or been a part of.

This research aims to find out what the relationship is between Moral Injury, PTSD and feelings of guilt and shame. This project may help to increase the understanding of moral injury which may, in the long term, benefit services and service users by contributing to the development of treatment specific therapies.

What will happen to me if I take part?

If you choose to take part, you will be asked to complete an online questionnaire. This questionnaire consists of 3 smaller questionnaires. One of these focuses on the frequency of exposure to morally injurious events, the other assesses PTSD symptoms and the third, levels of guilt and shame. The questionnaire will take approximately 10 minutes in total to complete, and you are asked not to consider your answers for too long.

Do I have to take part?

No. It is entirely up to you to decide. The information sheet provides you with all you need to know about the project to make your choice. You can request a copy of this by emailing the lead researcher. If you choose to participate, you will be asked to check three boxes to confirm that you understand the information that has been given to you and that you consent to take part. You will be free to withdraw at any time (up until the point of analysis which is the 1st September, 2017), without giving a reason and this will not affect you or your circumstances in any way.

What are the possible disadvantages and risks of taking part?

Participation involves thinking about your experiences during combat exposure in the military and this may be distressing for you. Any difficulties you have as a result of the study or any concerns you have about the process will be addressed. Please see Part 2 for details of this.

What are the possible benefits of taking part?

Participation involves thinking about your experiences during combat exposure in the military and this may be distressing for you. Should you feel that you have any difficulties as a result of taking part in this study there are sources of possible support that will be listed in part 2 of this information. Please make a note of these for your information.

Expenses and payments

Participants will not be paid for taking part in this study.

What will happen when the study ends?

On completion of the project all data will be securely stored for five years and then destroyed thereafter.

Will my taking part be kept confidential?

Yes. We will follow strict ethical and legal practice and all information about you will be handled in confidence. You will not be asked to provide any personal or identifiable information. Further details are included in Part 2.

What if there is a problem?

Any concern about the way you have been dealt with during the study or possible harm that you might suffer will be addressed. Detailed information is given in Part 2.

This concludes Part 1.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2

Who is organising and funding the study?

The lead researcher is organising the study as a Clinical Psychology trainee at Staffordshire University and will be supervised by Dr Helen Scott (Senior Lecturer in Clinical Psychology). It is for the Professional Doctorate in Clinical Psychology course and has been reviewed by the university's Ethics Committee.

What will happen if I don't want to carry on being part of the study?

Participation in this study is entirely voluntary. If you choose not to participate then this will not affect you in any way. If you decide to take part in the study, you will need to check the boxes on the consent form, which states that you agree to participate.

If you agree to participate, you may withdraw from the study at any time (up until the point of analysis which is 1st September 2017) without affecting you in any way. To do this you will need your unique identifier number which is:

${e://Field/ParticipantID}

Please keep a record of this number and should you wish to withdraw please contact the lead researcher (contact details and the end of this information) stating this number. Your data will then be withdrawn from the study and destroyed.

What if there is a problem?

Should you find that you are in any way negatively affected by taking part then the following organisations are available for you to contact for support:

- Combat Stress (www.combatstress.org.uk, 24 hour helpline: 08001381619)
- The Samaritans (www.samaritans.org, 24 hour helpline: 116 123)

- Mind (www.mind.org.uk)
- Your GP

You are free to contact these organisations as you choose to. This is not affected by any support you have previously received or if you were deemed to be “well” on leaving military service. Should you have a concern about the research that you feel is not able to be resolved in the first instance with the lead researcher (Vicky Aldridge), or if you prefer to speak to someone else, then the Academic Supervisor (Dr Helen Scott) is available for you to contact on the details below.

Will my taking part be kept confidential?

Yes. Analysis will take place on university premises using the appropriate software and by the researcher. Data will be stored on a password-protected personal computer and password protected memory stick. No data will be traceable to participants as no names or details will be included or collected. On completion of the project all data will be securely stored for ten years and destroyed thereafter. Only members of the research team (i.e. the lead researcher and supervisor) will have access to the data.

What will happen to the results of the study?

The findings of this study will be published in a journal. All data will be anonymised, which means that your name – or anything that identifies you – will not be used. You are also entitled to request a summary of the outcome of the research in paper format, which can be done by contacting the lead researcher. Contact information can be found at the end of this information.

Who has reviewed the study?

This study has been reviewed and approved by Staffordshire University Research Ethics Committee.

Further supporting information:

You have the right to ask questions about the research and should you have any questions about this research please contact the researcher prior to the start of the study.
The contact details are as follows:

Name of researcher: Vicky Aldridge
Address: c/o Staffordshire University, The Science Centre.
Email: *******
Name of Academic Supervisor: Dr Helen Scott
Address: c/o Staffordshire University, The Science Centre.
Email: *******

Thank you for taking the time to read this participant information leaflet.

Participant Consent Form

I confirm that I have read and understand the information sheet for the above study.

I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I consent to take part in this study.

Yes
No

I understand that relevant data collected during the study, may be looked at by individuals from Staffordshire University for the purpose of the study only.

I give permission for these individuals to have access to this data

Yes
No

I understand and agree for my data to be used anonymously in the write up of this project

Yes
No

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my care or legal rights being affected

Yes
No

Appendix D: Research advertisement ‘post’ for Facebook

Have you served in the UK military?

Have you been on deployment?

Are you over the age of 18?

If you are and would like to take part in research that will help others to understand the impact of deployment then please click on the link below…

http://staffordshire.eu.qualtrics.com/jfe/form/SV_86VRHACcmaWMlw1

Appendix E: Measures

MIQ-Military Version

Considering your active duty service during warzone deployment, mark the box that indicates how frequently you experienced the following:

Response:	(1) Never	(2) Seldom	(3) Sometimes	(4) Often
1. Things I saw/experienced in the war left me feeling betrayed or let-down by military/political leaders				
2. I did things in the war that betrayed my personal values				
3. There were times in the war that I saw/engaged in revenge/ retribution for things that happened.				
4. I had an encounter(s) with the enemy that made him/her seem more "human" and made my job more difficult				
5. I saw/was involved in violations of rules of engagement				
6. I saw/was involved in the death(s) of an innocent in the war				
7. I feel guilt over failing to save the life of someone in the war				
8. I had to make decisions in the war at times when I didn't know the right thing to do				
9. I feel guilt for surviving when others didn't				
10. I saw/was involved in violence that was out of proportion to the event				
11. I saw/was involved in the death(s) of children				
12. I experienced tragic warzone events that were chaotic and beyond my control				
13. I sometimes treated civilians more harshly than was necessary				
14. I felt betrayed or let-down by trusted civilians during the war				
15. I saw/was involved in a "friendly-fire" incident				
16. I destroyed civilian property unnecessarily during the war				
17. Seeing so much death has changed me				
18. I made mistakes in the warzone that led to injury or death				
19. I came to realize during the war that I enjoyed violence				

PTSD Checklist – Military Version (PCL-M)

Name: _____ Unit: _____
Best contact number and/or email: _____
Deployed location: _____

Instructions: Below is a list of problems and complaints that veterans sometimes have in response to a stressful military experience. Please read each one carefully, put an "X" in the box.

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1.	Repeated, disturbing *memories, thoughts, or images* of a stressful military experience?					
2.	Repeated, disturbing *dreams* of a stressful military experience?					
3.	Suddenly *acting* or *feeling* as if a stressful military experience *were happening again* (as if you were reliving it)?					
4.	Feeling *very upset* when *something reminded* you of a stressful military experience?					
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful military experience?					
6.	Avoid *thinking about* or *talking about* a stressful military experience or avoid *having feelings* related to it?					
7.	Avoid *activities* or *talking about* a stressful military experience or avoid *having feelings* related to it?					
8.	Trouble *remembering important parts* of a stressful military experience?					
9.	Loss of *interest* in things that you used to enjoy?					
10.	Feeling *distant* or *cut off* from other people?					
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12.	Feeling as if your *future* will somehow be *cut short?*					
13.	Trouble *falling* or *staying* asleep?					
14.	Feeling *irritable* or having *angry outbursts?*					
15.	Having *difficulty* concentrating?					
16.	Being "*super alert*" or watchful on guard?					
17.	Feeling *jumpy* or easily startled?					

Has anyone indicated that you've changed since the stressful military experience? Yes __ No__

Test of Self-Conscious Affect, Version 3

Below are situations that people are likely to encounter in day-to-day life, followed by several common reactions to those situations.

As you read each scenario, try to imagine yourself in that situation. Then indicate how likely you would be to react in each of the ways described. We ask you to rate all responses because people may feel or react more than one way to the same situation, or they may react different ways at different times.

For example:

A. You wake up early one Saturday morning. It is cold and rainy outside.

a) You would telephone a friend to catch up on news. (1)---2---3---4---5
not likely very likely

b) You would take the extra time to read the paper. 1---2---3---(4)---5
not likely very likely

c) You would feel disappointed that it's raining. 1---2---(3)---4---5
not likely very likely

d) You would wonder why you woke up so early. 1---2---3---(4)---5
not likely very likely

In the above example, I've rated ALL of the answers by circling a number. I circled a "1" for answer (a) because I wouldn't want to wake up a friend very early on a Saturday morning -- so it's not at all likely that I would do that. I circled a "5" for answer (b) because I almost always read the paper if I have time in the morning (very likely). I circled a "3" for answer (c) because for me it's about half and half. Sometimes I would be disappointed about the rain and sometimes I wouldn't -- it would depend on what I had planned. And I circled a "4" for answer (d) because I would probably wonder why I had awakened so early.

Please do not skip any items -- rate all responses.

1. You make plans to meet a friend for lunch. At five o'clock, you realize you have stood your friend up.

	not likely very likely
a) You would think: "I'm inconsiderate."	1---2---3---4---5
b) You'd think you should make it up to your friend as soon as possible.	1---2---3---4---5
c) You would think: "My boss distracted me just before lunch."	1---2---3---4---5

2. You break something at work and then hide it.

	not likely very likely
a) You would think: "This is making me anxious. I need to either fix it or get someone else to."	1---2---3---4---5
b) You would think about quitting.	1---2---3---4---5
c) You would think: "A lot of things aren't made very well these days."	1---2---3---4---5

3. At work, you wait until the last minute to plan a project, and it turns out badly.

	not likely very likely
a) You would feel incompetent.	1---2---3---4---5
b) You would think: "There are never enough hours in the day."	1---2---3---4---5
c) You would feel: "I deserve to be reprimanded for mismanaging the project."	1---2---3---4---5

4. You make a mistake at work and find out a co-worker is blamed for the error.

	not likely very likely
a) You would think the company did not like the co-worker.	1---2---3---4---5
b) You would keep quiet and avoid the co-worker.	1---2---3---4---5
c) You would feel unhappy and eager to correct the situation.	1---2---3---4---5

5. While playing around, you throw a ball, and it hits your friend in the face.

	not likely very likely
a) You would feel inadequate that you can't even throw a ball.	1---2---3---4---5
b) You would think maybe your friend needs more practice at catching.	1---2---3---4---5
c) You would apologize and make sure your friend feels better.	1---2---3---4---5

6. You are driving down the road, and you hit a small animal.

	not likely very likely
a) You would think the animal shouldn't have been on the road.	1---2---3---4---5
b) You would think: "I'm terrible."	1---2---3---4---5
c) You'd feel bad you hadn't been more alert driving down the road.	1---2---3---4---5

7. You walk out of an exam thinking you did extremely well, then you find out you did poorly.

	not likely very likely
a) You would think: "The instructor doesn't like me."	1---2---3---4---5
b) You would think: "I should have studied harder."	1---2---3---4---5
c) You would feel stupid.	1---2---3---4---5

8. While out with a group of friends, you make fun of a friend who's not there.

	not likely very likely
a) You would feel small...like a rat.	1---2---3---4---5
b) You would think that perhaps that friend should have been there to defend himself/herself.	1---2---3---4---5
c) You would apologize and talk about that person's good points.	1---2---3---4---5

9. You make a big mistake on an important project at work. People were depending on you, and your boss criticizes you.

	not likely very likely
a) You would think your boss should have been more clear about what was expected of you.	1---2---3---4---5
b) You would feel as if you wanted to hide.	1---2---3---4---5
c) You would think: "I should have recognized the problem and done a better job."	1---2---3---4---5

10. You are taking care of your friend's dog while they are on vacation. and the dog runs away.

	not likely very likely
a) You would think, "I am irresponsible and incompetent."	1---2---3---4---5
b) You would think your friend must not take very good care of her dog or it wouldn't have run away.	1---2---3---4---5
c) You would vow to be more careful next time.	1---2---3---4---5

11. You attend your co-worker's housewarming party, and you spill red wine on a new cream-colored carpet, but you think no one notices.

	not likely very likely
a) You would stay late to help clean up the stain after the party.	1---2---3---4---5
b) You would wish you were anywhere but at the party.	1---2---3---4---5
c) You would wonder why your co-worker chose to serve red wine with the new light carpet.	1---2---3---4---5

Appendix F: TOSCA Guilt subscale tests of normality

Tests of Normality

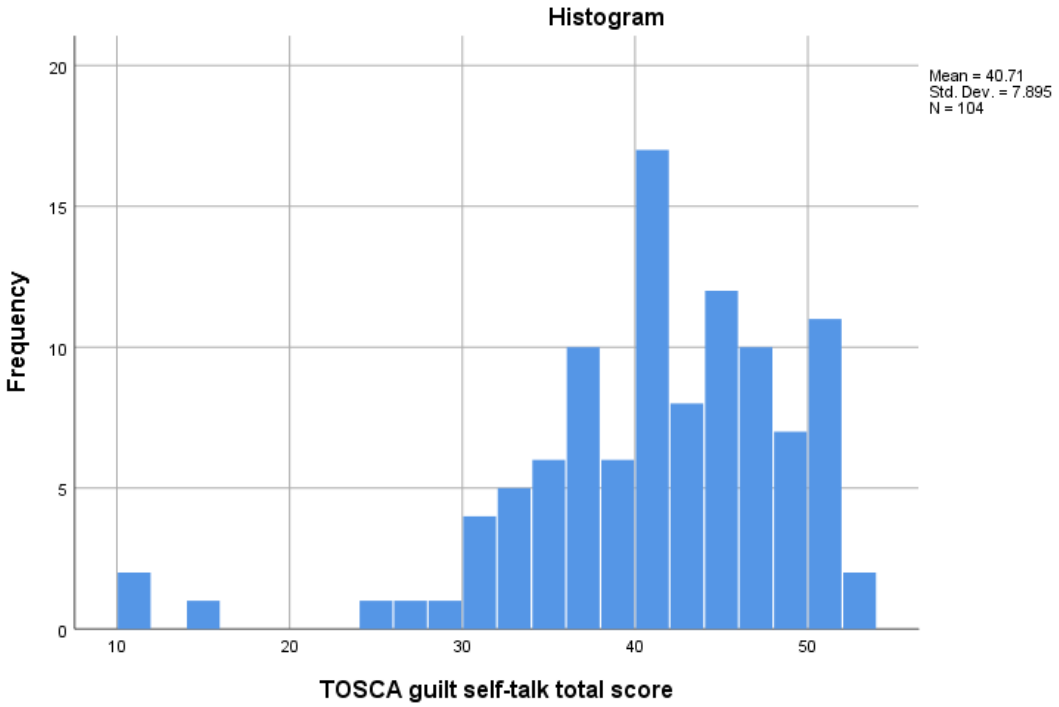
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MIQ-military version Total score	.119	104	.001	.962	104	.004
PCL-military version Total score	.068	104	.200*	.977	104	.065
TOSCA shame self-talk total score	.096	104	.019	.979	104	.104
TOSCA guilt self-talk total score	.108	104	.004	.900	104	.000

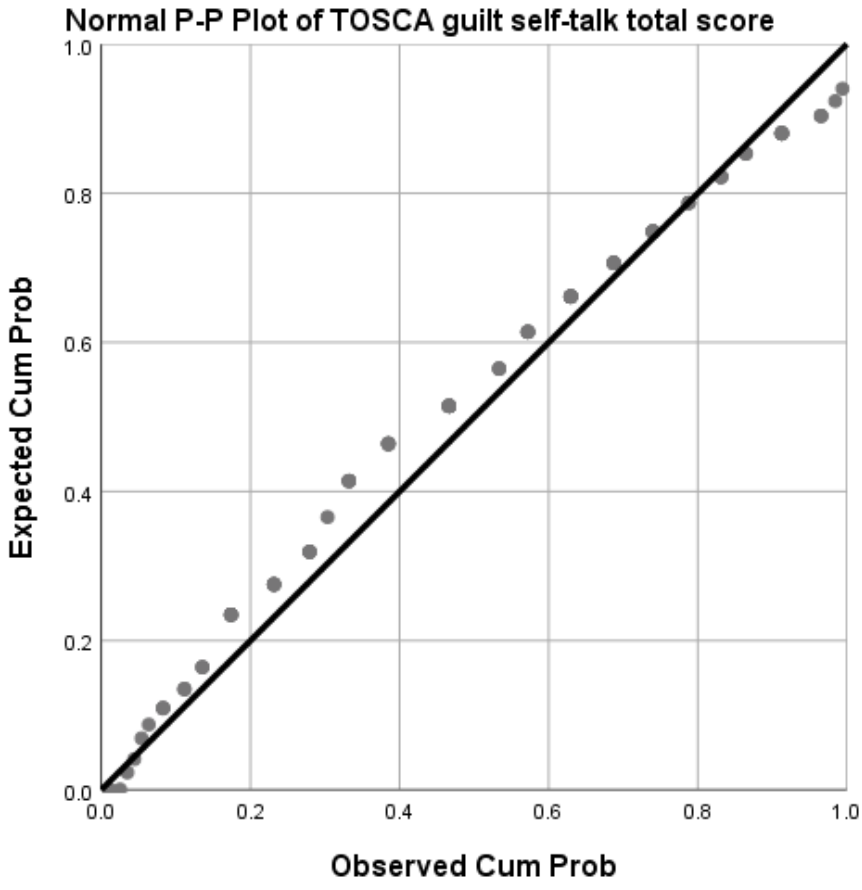
*. This is a lower bound of the true significance.

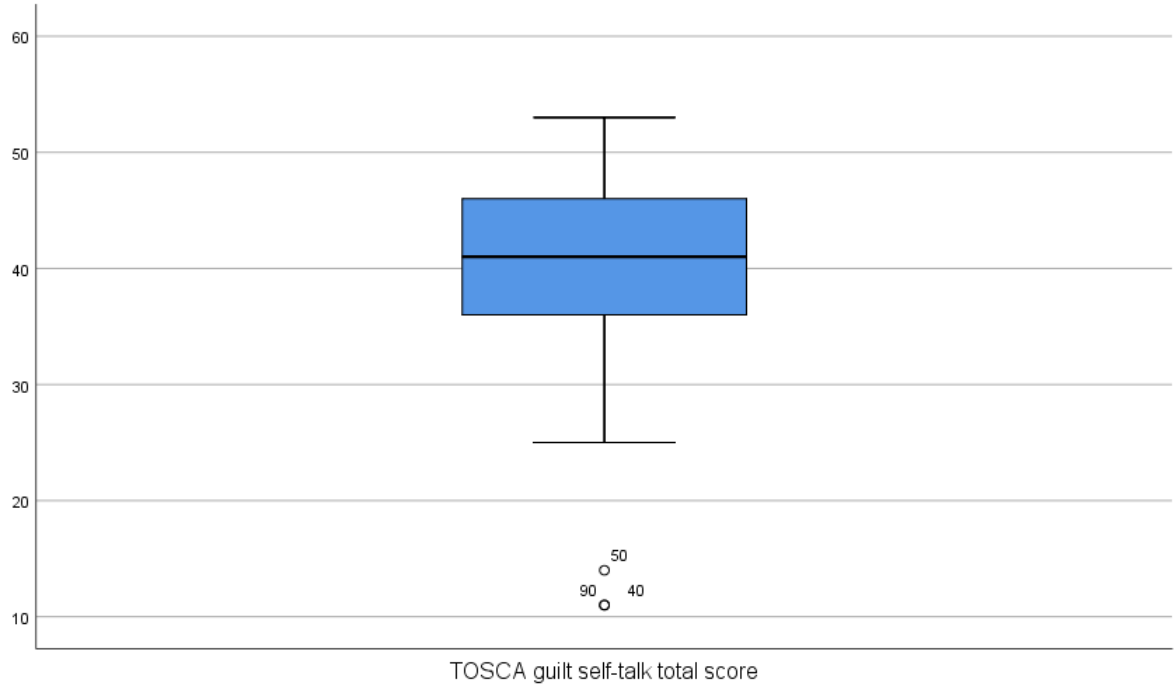
a. Lilliefors Significance Correction

Statistics

		MIQ-military version Total score	PCL-military version Total score	TOSCA shame self-talk total score	TOSCA guilt self-talk total score
N	Valid	104	104	104	104
	Missing	0	0	0	0
Skewness		.405	.172	.254	-1.405
Std. Error of Skewness		.237	.237	.237	.237
Kurtosis		-.762	-.798	-.568	3.340
Std. Error of Kurtosis		.469	.469	.469	.469


Histogram
Mean = 40.71
Std. Dev. = 7.895
N = 104
Frequency
0
5
10
15
20
10
20
30
40
50
TOSCA guilt self-talk total score


Normal P-P Plot of TOSCA guilt self-talk total score
Expected Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0
Observed Cum Prob


60
50
40
30
20
10
50
90
40
TOSCA guilt self-talk total score

Appendix G: Multiple regression model outliers removed.

Multiple regression model for predictors of MIQ-M and demographic variables: Age, Gender, Length of Service, Previous Therapy, PCL-M, TOSCA Guilt, TOSCA Shame. Outliers removed.

	B	*SE B*	*β*	*Sig.*	*95% CI*	
					Lower	*Upper*
Constant	37.31	11.75	-	.002	13.98	60.63
Age	-.07	.08	-.07	.366	-.22	.08
Gender	2.06	3.82	.04	.591	-5.53	9.65
Length of Service	-4.21	4.12	-.08	.310	-12.39	3.97
Previous Therapy	-1.67	1.96	-.08	.394	-5.56	2.21
PCL-M	.31	.06	.54	.000*	.19	.43
TOSCA Guilt	-.23	.14	-.14	.11	-.51	.05
TOSCA Shame	.18	.12	.16	.125	-.05	.41

Note: R^2 = .46; Adjusted R^2 = .42

Multiple regression model for significant predictors of MIQ-M: PCL-M and TOSCA Guilt. Outliers removed.

	B	*SE B*	β	*Sig.*	95% CI	
					Lower	Upper
Constant	22.64	5.52		.000*	11.68	33.60
PCL-M	.38	.05	.66	.000*	.29	.47
TOSCA Guilt	-.12	.13	-.07	.339	-.37	.13

Note: R^2 = .43; Adjusted R^2 = .42

Appendix H: Multiple regression with bootstrapping comparisons.

Multiple regression model for predictors of MIQ-M and demographic variables: Age, Gender, Length of Service, Previous Therapy, PCL-M, TOSCA Guilt, TOSCA Shame with bootstrapping comparisons

	Standard Multiple Regression						*Bootstrapping*				
	B	*SE B*	*β*	*Sig.*	*95% CI*		*Bias*	*SE B*	*Sig.*	*95% CI*	
					Lower	*Upper*				*Lower*	*Upper*
Constant	36.92	11.38		.002	14.32	59.51	-1.88	17.83	.023	-2.08	73.95
Age	-.07	.08	-.08	.324	-.22	.07	.01	.07	.323	-.20	.08
Gender	2.01	3.79	.04	.597	-5.51	9.53	-.72	6.05	.730	-9.77	15.54
Length of Service	-3.99	4.08	-.08	.330	-12.10	4.11	.26	7.57	.506	-22.0	10.42
Previous Therapy	-1.32	1.91	-.06	.491	-5.12	2.47	.31	2.08	.517	-5.16	3.44
PCL-M	.33	.06	.56	.000*	.21	.45	.01	.06	.001*	.22	.46
TOSCA Guilt	-.24	.11	-.19	.028*	-.46	-.03	.02	.10	.029*	-.42	-.02
TOSCA Shame	.16	.11	.14	.156	-.06	.37	-.01	.12	.210	-.08	.38

***p < 0.05**

Bootstrap results are based on 1000 bootstrap samples.

Multiple regression model for significant predictors of MIQ-M: PCL-M and TOSCA Guilt with bootstrap comparisons

	Multiple Regression - Predictors only						*Bootstrapping*				
	B	*SE B*	*β*	*Sig.*	*95% CI*		*Bias*	*SE B*	*Sig.*	*95% CI*	
					Lower	*Upper*				*Lower*	*Upper*
Constant	23.64	4.37		.000*	14.98	32.31	-.01	3.92	.001*	15.22	31.43
PCL-M	.39	.04	.66	.000*	.30	.47	-.00	.04	.001*	.30	.46
TOSCA Guilt	-.15	.10	-.12	.122	-.34	.04	.00	.09	.081	-.32	.04

***p < 0.05**

Bootstrap results are based on 1000 bootstrap samples.

Executive Summary

Moral Injury, Post-traumatic Stress Disorder, Guilt and Shame in Veterans

Word count: 2,194

Moral Injury, Post-traumatic Stress Disorder, Guilt and Shame in Veterans

Executive Summary

This report is intended as an accessible summary of a research project focusing on British veterans. The research considered the role of PTSD, guilt and shame in predicting moral injury in veterans that have experienced active deployment. The research method, findings and clinical implications are summarised below.

Background

Those who have previously served within the military forces, commonly known as veterans, are a unique group who risk their lives in order to serve their country. In doing so, at times they may suffer injuries that affect not only their role within the forces but also the civilian lives they return to. However, it is not only the visible wounds of war that cause veterans difficulties. In 2016 the Ministry of Defence released a bulletin summarising the reasons for all discharges across military services. For the purpose of this report the focus is on those discharged for mental health difficulties, specifically Post-traumatic Stress Disorder (PTSD). The table below shows the percentage of military personnel discharged for PTSD.

Percentage of medical discharges for PTSD	
Royal Navy	22%
Army	43%
Royal Air Force	24%

Combat is a unique experience where serving personnel can be faced with having to make difficult decisions. Sometimes these decisions result in military personnel having to question their own moral beliefs about what is right and wrong. The need to make difficult decisions is recognised as part of the role when serving in the armed forces (Farnsworth, Drescher, Nieuwsma, Walser & Currier, 2014). This, however, leaves serving personnel vulnerable to experiencing situations where they could potentially act or see something occur which goes against their own moral beliefs. When this occurs it can result in persistent feelings of guilt or shame and symptoms which present similarly to PTSD. This is suggested in literature to be a moral injury.

Moral injury is a fairly new concept in the field of psychology and therefore most of the evidence around it is theoretical and needs further work. However, more recently there has been an increase in research in this area. So far, this research suggests the following are some of the problems that a moral injury might cause:

- Persistent feelings of guilt or shame
- More likely to isolate themselves and withdraw from others
- Higher risk of self-injury
- Reduced ability to trust others
- Relationships with others become distant
- Individual's question their own ideals and identity

Evidence suggests that there is a close relationship between moral injury and PTSD because of the similarity in symptoms and also because moral injury appears to occur in situations that could also be considered traumatic experiences. PTSD was the main cause of discharges from the military for mental health problems in 2016 yet there is currently a lack of professional understanding about military-related trauma. The NHS has responded to this by calling for more specialised psychological interventions and competent assessment processes for veterans (Bashford, Hasan & Patel, 2016).

However, this requires that the field of psychology develops its knowledge about PTSD and similar presentations, such as moral injury.

Whilst the majority of veterans readjust back to civilian life without any problems, some suffer with prolonged mental health difficulties which can remain for, or surface many years later (Currier, Holland, Drescher & Foy, 2015). Despite this, only half of veterans with mental health problems seek help from the NHS (NHS England, 2016). By expanding professionals' knowledge of veterans' difficulties the barriers that veterans face with accessing mental health services may, in part, be broken down.

This research project aimed to further what is known about the relationship between moral injury, PTSD, guilt and shame in a British military population; with a view to expanding professional knowledge and contributing to clinical practice.

Method

Participants were recruited through the social media site Facebook and completed an anonymous online questionnaire. The research was a cross-sectional design; in that the data was collected at one time point. An advertisement for the research was in the form of a short 'post' (*Figure 1* below) with a link which prospective participants could follow to find out more and take part if they wanted to. The research was approved by Staffordshire University ethics committee.

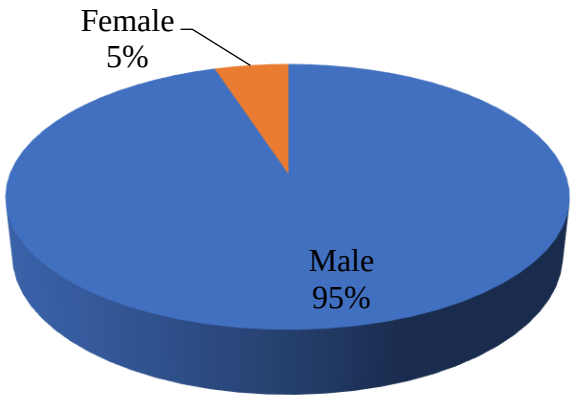
Figure 1: Facebook post

Have you served in the UK military?
Have you been on deployment?
Are you over the age of 18?

If you are and would like to take part in research that will help others to understand the impact of deployment then please click on the link below…

There were 104 veterans that took part in this study. All had served in the British military in the Royal Air Force, Army or the Royal Navy and had experienced active deployment. Active deployment was defined as being sent, as part of military service, to an area of conflict. The mean age of participants was 47 years, ranging from age 19 – 71 years. The percentage of males to females is identified in the diagram below (*Figure 2)*. The gender split fell in line with the ratio of males to females serving in the British military.

Figure 2: **Participant Gender**



Participant consent forms and an information sheet which outlined the background to the study, who could be contacted for more information or support and details on how participant data would be handled, were included at the beginning of the online questionnaire. Consent was obtained in line with Ethical Guidelines for Internet-mediated Research (British Psychological Society, 2013). The data collection period ran from 1st February 2017 to the 30th November 2017 inclusive. No participant identifiable information was collected. Participants could complete the questionnaire at a time convenient to them and the whole assessment took on average 10 minutes to complete. The following three assessments made up the questionnaire:

- **Moral Injury Questionnaire – Military Version (MIQ-M; Currier, Holland, Drescher, & Foy, 2015).**

  This is a 19 item measure which assesses the frequency of morally injurious events.

- **PTSD Checklist – Military Version (PCL-M; Blanchard, Jones-Alexander, Buckley & Forneris, 1996).**

  This is a 17 item self-report measure which assesses the symptoms of PTSD and is specific to a military population.

- **Test of Self-Conscious Affect (TOSCA; Tangney, Wagner, & Gramzow, 1989).**

  This is an 11 item measure which assesses the emotions of guilt and shame.

In addition to these measures and demographic data, participants were asked to report their length of time in service and to disclose if they had had previous therapy for any mental health difficulties which had occurred as a result of an experience they had had during their military service. These factors have previously been shown to influence the severity of PTSD either in a military population or the general population. As such data on these factors was also collected and used within the analysis to determine whether they had an influence on moral injury. The table below summarises the data collected on these factors:

		Percentage (%)
Length of Service	0-4 years	4%
	Over 4 years	96%
Previous Therapy	Yes	35%
	No	65%

In addition, the percentage of participants that were likely to meet a diagnosis of PTSD was calculated. This was based on the PCL-M measure and the recommended score of 50 or over which is used in other studies to indicate a probable PTSD diagnosis (Leskela, Dieperink & Thuras, 2002). Based on this 51% of participants met scores for a probable diagnosis of PTSD.

Results

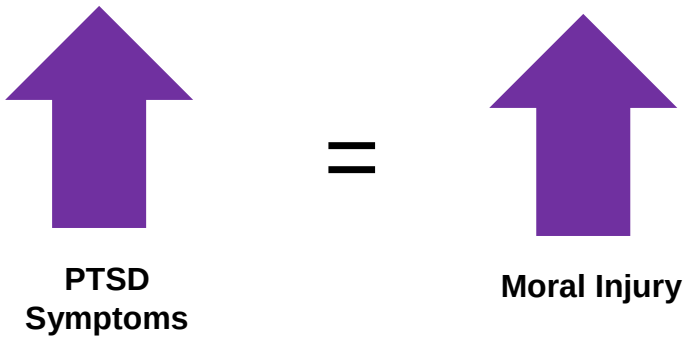
The measure of moral injury and the measure of PTSD were closely related. This suggested that as a score on the PTSD measure increased, so did participant's scores on the measure of moral injury. This may suggest some cross-over of symptoms on each of these two measures however, this was not to a concerning degree.

A statistical analysis was completed using SPSS, a statistical software package (IBM Corporation, 2017). The analysis determined whether PTSD, guilt or shame predicted moral injury. Age, gender, length of service and previous therapy were also included in the analysis for consideration as predictors of PTSD. Essentially the question asked of the analysis was whether a greater severity of PTSD, guilt or shame results in a greater severity of moral injury.

A multiple regression analysis was carried out. This identified PTSD and guilt as predictors of moral injury. In that those with a higher score on the guilt measure would also have a higher score on the moral injury measure and those with a higher score on the PTSD measure also had a higher score on the moral injury measure. Age, gender, length of service, previous therapy and shame did not predict moral injury in this sample. The findings at this stage accounted for 43% (R^2) of the variance. This means that the PTSD and guilt measure were responsible for explaining 43% of the variation or difference between participants in this study. That means that a further 57% of variation is not explained by PTSD or guilt, and therefore other factors are presumed to also be involved in explaining moral injury.

In order to improve the reliability of the proposed model it is necessary to run the regression analysis again with only those that predicted moral injury. As such it was run again with only PTSD, guilt and moral injury included. This time guilt was no longer a predictor. The final model accounted for 42% (R^2) of the variance. This suggested that in the previous model PTSD was responsible for the majority of the variance and guilt very little. Essentially, a greater degree of PTSD symptoms reported equalled a greater degree of moral injury; as summarised in the diagram below:

Figure 3: **Diagram summarising the results**



Clinical Implications

The findings of this research suggest that when working with military veterans who have PTSD, clinicians may find it helpful to talk and ask about exposure to morally injurious events. It may also be relevant, when working with veterans with PTSD, to consider whether existing psychological interventions successfully address moral injury. Symptoms of moral injury may exist which are not fully accounted for by a diagnosis of PTSD, and therefore existing PTSD interventions may not sufficiently address these symptoms.

One of the clear recommendations from NHS England is that competent assessments and specialist interventions should be developed based on evidence-based practice (Bashford et al., 2016). In order to be able to assess for moral injury it may help clinicians to firstly develop their own

awareness of moral injury and to have an understanding of the presenting symptoms that may be indicators of its presence. They can do this by engaging with existing research, carrying out further research and interacting with colleagues who may have a wider knowledge base. It may also be beneficial for clinicians to assess clients for moral injury before and after psychological interventions. This would help to ensure psychological interventions are successful in reducing symptoms of moral injury.

Limitations

- The data was collected during one specific time frame in a participant's life; as such there was no previous data to compare to. It is therefore not possible to know whether symptoms of either PTSD or moral injury existed prior to the combat experience.

- The study used social media to collect the data. This relied on participants to self-disclose their eligibility to take part. It is not possible to know whether the details they gave were accurate and so the participant sample is not verified.

- It was beyond the scope of this study to include all possible factors which may impact on the development of moral injury. There are additional factors, relevant to PTSD for example, which may also have been important to include when considering moral injury. Type of trauma is one of these.

- The measure of guilt and shame used within this study asks questions about guilt and shame based on scenarios that might occur in everyday life. Due to the measure asking about non-military situations it may not be specific enough for measuring guilt and shame in this sample.

Future research recommendations

- Research that is designed to collect data before and after combat exposure would be helpful in order to be able to say with certainty that

the moral injury is related to combat experiences and whether PTSD was present prior to the moral injury or not.

- Research focused on finding out what psychological interventions are successful in reducing symptoms of moral injury. The use of measures of moral injury before and after therapy would be one means of doing this.

Dissemination of findings

Participants are able to contact the researcher for a copy of this report. Researcher contact details were provided at the time of consenting to take part in the research. The research will also be submitted to peer-reviewed journal for publication. Should this be made freely available online then it will also be shared on the researcher's own social media research page.

Conclusion

The aim of the current study was to examine whether a greater severity of PTSD, guilt and shame were predictors of moral injury in military veterans that had experienced active deployment. The findings indicated that PTSD was a significant predictor of moral injury. It was surprising, given the existing research into moral injury, that guilt and shame did not predict moral injury.

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