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RESEARCH ARTICLE

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The loss of a fellow service member: Complicated grief in post-9/11 service members and veterans with combat-related posttraumatic stress disorder

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Abstract

Bereavement is a potent and highly prevalent stressor among service members and veterans. However, the psychological consequences of bereavement, including complicated grief (CG), have been minimally examined. Loss was assessed in 204 post-9/11, when service members and veterans with combat-related posttraumatic stress disorder (PTSD) took part in a multicenter treatment study. Those who reported the loss of an important person completed the inventory of complicated grief (ICG; $n = 160$). Over three quarters (79.41%) of the sample reported an important lifetime loss, with close to half (47.06%) reporting the loss of a fellow service member (FSM). The prevalence of CG was 24.75% overall, and nearly one third (31.25%) among the bereaved. CG was more prevalent among veterans who lost a fellow service member (FSM) (41.05%, $n = 39$) compared to those bereaved who did not (16.92%, $n = 11$; OR = 3.41, 95% CI: 1.59, 7.36). CG was associated with significantly greater PTSD severity, functional impairment, trauma-related guilt, and lifetime suicide attempts. Complicated grief was prevalent and associated with adverse psychosocial outcomes in veterans and service members with combat-related PTSD. Clinicians working with this population should inquire about bereavement, including loss of a FSM, and screen for CG. Additional research examining CG in this population is needed.

KEYWORDS
combat-related PTSD, bereavement, military, death, war buddy suicide, complicated grief

1 | INTRODUCTION

Bereavement is a highly distressing and disruptive experience. It is associated with the onset of a range of mental health conditions, including major depressive disorder (MDD) and posttraumatic stress disorder (PTSD; Keyes et al., 2014). In addition, approximately 7% of bereaved individuals will experience complicated grief (CG), a syndrome associated with adverse psychosocial outcomes, including increased risk for suicide (Kersting, Brahler, Glaesmer, & Wagner, 2011; Marques et al., 2013; Simon et al., 2011; Tal et al., 2016).

Significance

This study found that exposure to the loss of a fellow service member occurs commonly and is associated with complicated grief (CG) amongst service members and veterans with combat-related posttraumatic stress disorder (PTSD). Further, the presence of CG was associated with more severe PTSD, guilt, and lifetime suicide attempts, as well as poorer function. This study supports that clinicians should ask veterans and service members with PTSD about military losses and associated CG symptoms and future research should examine the optimal way to address CG in this military population.

Complicated grief (also referred to as prolonged grief disorder or traumatic grief) was recently proposed as a disorder needing further study within the newly formed trauma and stressor related conditions category of DSM-5 under the name persistent complex bereavement disorder (PCBD). (American Psychiatric Association, 2013). Unlike acute grief, a variable but time-limited response to loss, CG is a persistent, intense and impairing condition diagnosed when distressing and disabling grief has persisted at least 6 months following the loss.

Core symptoms of CG include intense yearning or longing for the deceased, sorrow or emotional pain, and preoccupation with thoughts about the death or the deceased (Simon et al., 2011). Additional symptoms include difficulty accepting the death, avoidance of reminders of the deceased or of the permanence of the loss, difficulty planning for the future, role and identity confusion, feeling that life is unbearable without the deceased, and a wish to die to join the deceased (Mauro et al., 2016; Simon et al., 2011). Although CG shares many similar symptoms with other stress-related disorders, such as PTSD and MDD, it also includes symptoms that are not observed in PTSD or MDD, and CG can occur independently of these conditions (Bonanno et al., 2007; Simon, 2012). For instance, fear is a central component of PTSD, but is not characteristic of CG, whereas yearning and attachment-related concerns are characteristic of CG but not PTSD (Simon, 2012). Nonetheless, due to the partial overlap of symptoms and etiological factors, CG frequently co-occurs with psychiatric disorders such as PTSD, MDD, and a range of other anxiety disorders. Additionally, comorbidity between CG and these disorders is associated with significantly greater grief severity as well as greater work and social impairment (Marques et al., 2013; Simon et al., 2007).

Service members and veterans are at especially high risk for exposure to potentially traumatic events, including sudden and violent combat losses, suggesting bereavement-related distress may be prevalent (Wisco et al., 2014). In a representative sample of 3,157 United States veterans of all eras, 87% reported exposure to at least one potentially traumatic event, and sudden death of a loved one was the most frequently endorsed of those events (Wisco et al., 2014). One study of Vietnam veterans seeking treatment for PTSD reported that the loss of fellow service members (FSM) in combat was associated with increased grief, but not with PTSD or depression (Pivar & Field, 2004). Notably, the authors concluded that grief following the loss of a FSM was similar in severity to the level of grief following spousal losses (Pivar & Field, 2004). In another study of Vietnam veterans, combat-related losses were uniquely associated with impairment, yet not related to the severity of PTSD, suggesting more attention to grief after combat losses is needed in all veterans (Currier & Holland, 2012). To date, a small number of studies have examined grief in post-9/11 service members and veterans. In one study of active duty service members, 75% reported having lost a FSM and 21% reported having difficulty coping with the death of someone close (Toblin et al., 2012). Further, bereavement has been associated with physical and functional impairment in this population, even when accounting for PTSD and depression (Fink, Gallaway, & Millikan, 2013; Toblin et al., 2012).

Veterans of all eras are also at risk for psychiatric sequelae of bereavement from suicide as a result of the high rate of suicide in this population (Hom, Stanley, Gutierrez, & Joiner, 2017). A recent study of 931 veterans found that nearly half (47%) reported lifetime exposure to suicide, which in turn was associated with increased rates of depression, anxiety, PTSD, and prolonged grief (Cerel et al., 2015). Similarly, a large study in veterans found that 51% reported loss of a friend to suicide, and such exposure was in turn associated with suicidal thoughts and behaviors (Hom et al., 2017). Despite the high level of exposure to sudden and violent losses such as suicides among veterans and the negative outcomes associated with these exposures, grief remains understudied in this population. Indeed, while there is a vast literature on PTSD prevalence and its impact on veterans and service members, very little is known about CG in the military, especially among our most recent service members. Further, while veterans with combat-related PTSD may be particularly at risk for exposure to loss and the development of co-occurring psychiatric conditions, there is limited knowledge about the prevalence of co-occurring CG or the severity of CG symptoms in this population.

The present study aims were to examine the prevalence of loss, and the prevalence, severity, and impact of CG in a well-characterized, post-9/11 veteran population seeking care for combat-related PTSD. We hypothesized that the presence of CG would be associated with greater clinical severity, including PTSD severity, functional impairment, trauma-related guilt, and suicidal ideation and behaviors. We also hypothesized that the loss of a fellow service member in veterans with combat-related PTSD would be associated with a higher prevalence of CG compared to other types of losses.

2 | MATERIALS AND METHODS

2.1 | Participants

Participants were post-9/11 active-duty service members or veterans who served during Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and/or Operation New Dawn (OND) with combat-related PTSD who were enrolled in and met entry criteria for a Department of Defense-funded multicenter randomized controlled treatment trial between November 2011–May 2016. The parent treatment study, PROGrESS: PROlonGed ExpoSure Sertraline: Randomized Controlled

Trial of Sertraline, ProlongedExposure Therapy and Their Combination of OEF/OIF with PTSD examined clinical and biological predictors and outcomes for prolonged exposure (PE) therapy compared to sertraline plus enhanced medication management, or the combination of sertraline and PE. Eligible participants had a primary diagnosis of combat-related chronic PTSD with at least three months duration defined by the clinician administered PTSD scale for DSM-IV (CAPS) score of 50 or higher, as assessed by certified raters. Combat-related trauma was defined as any directly witnessed or directly participated in event that involved violence, the threat of violence, or the aftermath of violence (e.g., firefights, IED attacks, bombings, recovering bodies, suicide attacks). Exclusion criteria were designed to include a generalizable treatment-seeking population. Excluded participants were those with active psychosis, alcohol or substance dependence within the previous 8 weeks, current antidepressants or antipsychotic use, prior intolerance to sertraline or PE, medical illness likely to result in hospitalization, and serious cognitive impairment that would preclude meaningful participation. Participants with bipolar disorder who were currently euthymic and on a mood stabilizer (e.g., lithium, valproate) at stable doses for at least 2 weeks prior to entry were included. Women of childbearing age were required to use contraception, and not be pregnant or lactating.

2.2 | Procedure

All participants signed informed consent prior to clinical screening procedures at one of four sites: the VA Ann Arbor Healthcare System, University of Michigan; Massachusetts General Hospital; Ralph H. Johnson VA Medical Center, Medical University of South Carolina; and VA San Diego Healthcare System, University of California San Diego. The intake assessment consisted of a structured clinical interview with the MINI international neuropsychiatric interview (MINI) for DSM-IV version 5.0 (Sheehan et al., 1998) as well as the clinician-administered PTSD scale (CAPS) for DSM-IV (Blake et al., 1995) with a trained rater, followed by baseline self-report forms, which included the 19-item inventory of complicated grief (ICG) (Prigerson et al., 1995). This study reports on baseline assessments only, which were completed prior to randomization to one of the three treatment conditions.

2.3 | Measures

In addition to a standard assessment of demographics and type of military service, DSM-IV psychiatric diagnoses were assessed using the MINI interview by trained and certified raters (Sheehan et al., 1998). The total number of comorbid psychiatric disorders was calculated as the sum of all current Axis-I disorders assessed by the MINI, combining substance and alcohol use disorders, which yielded a maximum possible total of 9 independent diagnoses (Table 3).

2.3.1 | Inventory of complicated grief

Inventory of complicated grief (ICG) is a validated, 19-item self-report measure used to assess the impact of loss and to identify individuals with threshold CG, which is defined as an ICG score of 30 or higher (Prigerson et al., 1995). Each item is rated on a scale from 0 (not at all) to 4 (always) and summed. The scale was completed only if the participant selected yes to the cover sheet question "Have you had an important person in your life pass away?" The cover sheet also included questions about the relation of the important loss or losses they had experienced in their lifetime on a checklist, including spouse, parent, child, sibling, grandparent, grandchild, other relative, significant other, partner, fiancé, friend, fellow service member, or other. More than one important loss could be reported. Participants were then asked to indicate which death was the most distressing, and to complete the ICG symptom questionnaire in relation to this loss.

2.3.2 | Clinician-administered PTSD scale

Clinician-administered PTSD scale (CAPS) is a structured clinician interview commonly used to assess the intensity, frequency, and severity of PTSD symptoms (Blake et al., 1995; Weathers, F.W., Keane, T.M., & Davidson, 2001. The CAPS is a 30-item clinician administered scale that assesses the frequency (scale 0 [none of the time] to 4 = [most or all of the time]) and intensity (scale 0 = [none] to 4 = [extreme]) of PTSD symptoms based on the DSM-IV criteria. Clinicians assess re-experiencing, avoidance and numbing, and hyperarousal symptoms as they relate to the primary reported traumatic event. All study raters underwent certification procedures including completion of standardized training developed by the National Center for PTSD.

2.3.3 | PTSD checklist

PTSD checklist-specific stressor version (PCL-S) is a 17-item, self-report assessment of DSM-IV PTSD symptoms using a 5-point scale, from 1 (not at all) to 5 (very often) such that higher scores represent greater PTSD severity. (Weathers, Litz, Herman, Huska, & Keane, 1993) It has been well-validated to assess PTSD symptoms in civilian and military populations (Wilkins, Lang, & Norman, 2011).

2.3.4 | Trauma-related guilt inventory

Trauma-related guilt inventory (TRGI) is a 32-item, self-report questionnaire designed to measure cognitive and emotional aspects of guilt associated with the experience of a traumatic event (Kubany et al., 1996). The TRGI has three factors (guilt, distress, and guilt cognitions). The guilt cognitions factor is split into three sub-scales (hindsight-bias/responsibility, wrongdoing, and lack of justification). All factor and subscale scores are reported on a scale from 0 to 4, where high scores represent the strongest endorsement of cognitions or most extreme or frequent symptoms.

2.3.5 | Inventory of psychosocial functioning

Inventory of psychosocial functioning (IPF) is an 80-item self-report measure to evaluate functional impairment related to PTSD and other stress-related disorders in seven life domains (romantic relationships, family relationships, work, friendships and socializing, parenting, education, and self-care). The scale is rated on a 0–100% scale, where higher values indicate greater functional impairment (Rodriguez, Holowka, & Marx, 2012).

2.3.6 | Columbia suicide severity rating scale

Columbia suicide severity rating scale (C-SSRS) is a standardized 8-point clinician-administered rating assessing a wide spectrum of suicidal ideation and behaviors (Posner et al., 2008; Posner et al., 2011). We utilized the measure in the present study to determine the presence of past month and lifetime suicidal ideation as well as lifetime history of suicide attempts.

2.4 | Statistical methods

The prevalence of different types of losses as well as the overall prevalence of CG (defined as ICG scores $\geq$ 30) was examined in participants at the study baseline visit, excluding individuals with missing loss data. We then limited our analyses about the impact of CG to those veterans who had experienced the loss of at least one important person and who had completed the ICG ($n = 160$), and divided the sample into those with CG and those without CG, consistent with many prior studies (Marques et al., 2013; Shear et al., 2016; Shear et al., 2014; Simon et al., 2007; Simon et al., 2011). The types of losses were determined by the ICG coversheet checklist of the relation(s) of the deceased as well as additional losses mentioned as the most distressing losses on the ICG or in the CAPS and TRGI form event descriptions. Types of losses experienced overall were then recoded into fellow service member (FSM), parent (mother or father), sibling (brother or sister), partner (spouse or significant other/partner/fiancée), child (son or daughter), grandparent (grandfather or grandmother), other relative (grandson, granddaughter, or 'other relatives'), friends, and 'other'. In cases where participants indicated both "fellow service member" and "friend" as the most important loss, which occurred for 29.31% of individuals that reported a FSM loss, the losses were counted in both categories (i.e., FSM and friend).

T-tests (for continuous variables) and Barnard's Exact Tests (for categorical variables) were used to assess for differences between bereaved veterans with and without CG for demographics, the presence of co-occurring mood, anxiety, and substance use disorders, the presence of any suicidal ideation lifetime or past month, lifetime suicide attempts, PTSD symptom severity (CAPS and PCL-S), trauma-related guilt (TRGI), and psychosocial functioning (IPF; Lydersen, Fagerland, & Laake, 2009). We conducted multiple regression analyses to assess the association of grief symptoms (ICG total scores) with psychosocial functioning (IPF score) after adjusting also for comorbid depression (current MDE diagnosis vs. not) and PTSD symptom severity (CAPS totals scores) as covariates. In order to examine the overall impact of the loss of a FSM, we first evaluated whether the prevalence of CG and grief symptom severity (ICG total scores) differed for those who had reported the loss of a FSM as an important loss (regardless of whether it was listed as the most distressing of the losses selected) compared to those bereaved who had not reported having lost a FSM, using logistic regression and a one-way ANOVA, respectively. Given the ICG loss summary allowed the inclusion of multiple losses and instructed participants to complete the ICG in relation to the most distressing loss the participants listed, we then repeated the same analyses among those who specifically identified their most distressing loss as a FSM compared to those with any other type of loss listed as the most distressing loss to confirm the prevalence of CG and grief symptom severity was specifically tied to the loss of a FSM. All tests were done using two-sided .05 level tests, and analyses were performed using SAS 9.4 of the SAS System for Windows (https://www.sas.com/en_us/home.html; RRID: SCR_008567).

3 | RESULTS

Among the 223 post-9/11 veterans with a primary diagnosis of PTSD who entered the trial, 19 had missing data about loss and were excluded. Thus, the overall prevalence of loss was examined in the 204 participants who responded with data about whether they had lost "an important person" in their life, of whom 79.41% ($n = 162$) reported at least one death and 47.06% (n = 96) reported the loss of at least one FSM. Two individuals reported a loss but did not complete the ICG and were excluded from all subsequent analyses. Among the remaining 202 veterans, 50 had ICG scores $\geq$ 30; thus, the CG prevalence in the combined bereaved and non-bereaved PTSD sample was 24.75%. For all remaining analyses, we included only the 160 participants who reported the loss of at least one important person and completed the ICG.

Demographics of our bereaved sample ($n = 160$) are described in Table 1. The bereaved veterans were predominantly male (88.75%) and White (55.97%) or Black (32.08%), with a mean age of 35.03 years (SD = 8.54, range: 20–61). Most of the bereaved veterans (68.79%) had been deployed more than once. The mean number of types of losses reported was 2.07 (see loss categories above; SD = 1.06, range: 1–5), with 63.75% ($n = 102$) reporting more than one loss type. Participants' relationships to the deceased are described in Table 2. No veterans reported the loss of a daughter, grandson, or spouse. Fully, 59.4% ($n = 95$) reported the loss of a FSM, and nearly two-thirds of these (61.1%, $n = 58$) identified this loss in the description of their most distressing loss.

3.1 | Presence and correlates of co-occurring complicated grief in bereaved veterans

For the bereaved sample, the mean ICG score was 23.79 (SD = 13.46: Figure 1 for distribution). The prevalence of CG in the bereaved sample was 31.25% ($n = 50$), with a mean ICG score of 39.70 (SD = 7.98) in this CG subgroup. There were no significant differences in any demographic variables between bereaved veterans with or without CG (Table 1). The prevalence of comorbid mental health conditions in addition to the primary combat-related PTSD diagnosis or the presence of CG were high overall, with only 5.00% ($n = 8$) with no comorbid conditions and 71.88% ($n = 115$) with more than one comorbidity. The mean number of comorbid conditions did not vary by presence of CG (mean [SD] by group: 2.25[1.26] without CG vs. 2.48[1.20] with CG; $t_{158} = -1.06$, $p = .29$). Many (62.50%, $n = 100$) met criteria for a major depressive episode (MDE), with an even higher prevalence among those with CG (74.00%) than those without (57.27%; Barnard's $Z = 2.03$, $p = .0452$; Table 3). The prevalence of anxiety and substance use disorders did not vary by the presence of CG.

TABLE 1 Sociodemographic variables for bereaved post-9/11 veterans overall with and without CG

	Loss without CG *N* (%)	Loss with CG *N* (%)
	N = 110	*N* = 50
Age, years, *M*(SD)	35.56 (8.98)	33.9 (7.44)
Women	14 (12.73)	4 (8.00)
Race		
White	61 (55.96)	28 (56.00)
Black	35 (32.11)	16 (32.00)
Other	13 (11.93)	6 (12.00)
Hispanic ethnicity	12 (11.11)	2 (4.08)
Marital Status		
Married or remarried	57 (51.82)	26 (52.00)
Separated/divorced	27 (24.55)	12 (24.00)
Never married	26 (23.64)	12 (24.00)
Education		
Completed high school or less	40 (36.36)	21 (42.00)
Employment Status		
Fulltime employed	52 (47.27)	28 (56.00)
Unable to find work, of those not employed	17/44 (38.64)	6/15 (40.00)
Military history		
Regular armed services	94 (85.45)	44 (88.00)
National Guard	13 (11.82)	4 (8.00)
Reserve	3 (2.73)	2 (4.00)
Deployed more than once	75 (69.44)	33 (67.35)

Note: All between-group differences were non-significant ($p > 0.05$). The following demographic variables had missing observations: race-1 without CG; ethnicity-2 without CG, 1 with CG; number of deployments-2 without CG, 1 with CG.

Participants with CG reported higher PTSD severity compared to those without CG as measured by both the clinician-rated CAPS past month score and the self-rated PCL-S total scores, as well as all PCL-S subscales (Table 4). In addition, those with CG had greater levels of trauma-related guilt and distress as measured by the three factors of the TRGI (global guilt, distress, and guilt cognitions) and all guilt cognition subscales, with the exception of the lack of justification subscale (Table 4). CG was also associated with greater functional impairment, as measured by the IPF.

In order to examine the independent association of CG with psychosocial function, we examined the association of CG symptoms (ICG score) with functional impairment (IPF score) in a multiple regression model including covariates for PTSD severity (CAPS total score) and current depression. This analysis indicated that both grief symptoms

TABLE 2 Prevalence of various loss types and self-report of most distressing losses reported by bereaved veterans ($n = 160$)

Types of Losses	Prevalence *N* (%)	Loss characterized as most distressing *N* (%)
Fellow service member	95 (59.38)	58 (36.25)
Parent	38 (23.75)	22 (13.75)
Sibling	15 (9.38)	5 (3.13)
Partner	3 (1.88)	0 (.00)
Child	2 (1.25)	2 (1.25)
Grandparent	88 (55.00)	40 (25.00)
Other relative	40 (25.00)	16 (10.00)
Friend	48 (30.00)	28 (17.50)
Other	2 (1.25)	1 (.63)

Note: More than one loss category could be reported for both important and most distressing losses.

TABLE 3 Prevalence of current psychiatric comorbidities for bereaved post-9/11 veterans with and without CG

	Loss without CG *N* (%) *N* = 110	Loss with CG *N* (%) *N* = 50
Any mood disorder	84 (76.36)	44 (88.00)
Major Depressive Episode (MDE), past 2 weeks[a]	63 (57.27)	37 (74.00)
Dysthymia, past 2 years	11 (10.19)	4 (8.00)
Bipolar, current	10 (9.09)	3 (6.00)
Any anxiety disorder	45 (40.91)	23 (46.00)
Social Anxiety Disorder (SAD), past month	14 (12.73)	10 (20.00)
Generalized Anxiety Disorder (GAD), past 6 months	27 (24.55)	15 (30.00)
Panic disorder with agoraphobia, past month	10 (9.09)	5 (10.00)
Panic disorder without agoraphobia, past month	2 (1.83)	1 (2.00)
Obsessive-compulsive Disorder (OCD), past month	10 (9.09)	4 (8.00)
Any substance-related disorder[b]	24 (21.82)	10 (20.00)
Alcohol abuse, past 12 months	9 (8.33)	7 (14.00)
Alcohol dependence, past 12 months	13 (11.82)	2 (4.00)
Substance abuse, past 12 months	2 (1.82)	1 (2.00)
Substance dependence, past 12 months	1 (.91)	0 (.00)
Total comorbid axis-I disorders		
No comorbid psychiatric disorders	8 (7.27)	0 (0.00)
One psychiatric disorder	23 (20.91)	14 (28.00)
Two psychiatric disorders	36 (32.73)	12 (24.00)
Three psychiatric disorders	24 (21.82)	11 (22.00)
> 3 psychiatric disorders	19 (17.27)	13 (26.00)

Note: All group differences were non-significant ($p > .05$) except for the group difference in current MDE. The following diagnoses had missing observations: dysthymia ($n = 2$), panic disorder without agoraphobia ($n = 1$), alcohol abuse ($n = 2$).
[a]MDE group difference: Barnard's $Z = 2.03$, $p = .045$.
[b]Alcohol- and substance-related dependence disorder determined based on occurrence in the past 12 months, but not the past 2 months, which was exclusionary in the present study.

(ICG total, $\beta \pm$ SE: .20 ± .08, standardized $\beta = .19$, $t = 2.59$, $p = .0106$) and PTSD symptom severity (CAPS total, $\beta \pm$ SE: .43 ± .07, standardized $\beta = .42$, $t = 5.80$, $p < .0001$) were independently associated with impairment in psychosocial functioning, while a current major depressive episode was not ($\beta \pm$ SE: .97 ± 2.18, standardized $\beta = .03$, $t = .44$, $p = .66$). There was no evidence of multicollinearity (all VIFs < 1.09).

Although rates of any current or lifetime suicidal ideation, as measured by the C-SSRS, were high among those with CG (16.67% current, 52.08% lifetime), they did not significantly differ from those without CG (12.38% current, 40.95% lifetime; Table 4). Bereaved veterans with CG, however, were significantly more likely to report the occurrence of one or more lifetime suicide attempts (14.58%, $n = 7$) compared to those without CG (4.81%, $n = 5$; Table 4). The overall prevalence of veterans reporting lifetime suicide attempts was 7.89% ($n = 12$ out of 152 participants with suicide data); it is worth noting, however, that 11 of the 12 veterans with a lifetime suicide attempt also had a diagnosis of a current MDE.

3.2 | Impact of loss of a fellow service member

In order to better understand the impact of the loss of a FSM on the prevalence of CG among a military population with combat-related PTSD, we compared those who reported the loss of a FSM ($n = 95$) to those who had not ($n = 65$). The prevalence of CG was significantly higher among those who lost a FSM (41.05%; $n = 39$) compared to those who did not (16.92%, $n = 11$; odds ratio = 3.41, 95% confidence interval: 1.59, 7.36), and ICG symptom scores were on average 6.99 points higher in the bereaved veterans who reported a FSM as an important loss compared to those who did not (mean [SD] by group: 26.63[12.95] vs. 19.65[13.20]; $F_{1,158} = 11.05$, $p = .0011$). In confirmatory analyses, those who specifically identified a FSM as their most distressing loss ($n = 58$) were more likely to meet threshold criteria for CG (48.28%, $n = 28$) compared to those who reported another, non-FSM loss as the most distressing (21.57%, $n = 22$; OR: 3.39, 95% CI: 1.69, 6.82). Similarly, the ICG scores of bereaved veterans who had lost a FSM and identified that loss as their most distressing loss were on average 7.90 points higher than those of veterans who identified another loss as most distressing (mean [SD] by group: 28.83[11.93] vs. 20.93[13.49]; $F_{1,158} = 13.75$, $p = .0003$).

4 | DISCUSSION

These data, derived from a well-characterized treatment-seeking sample of post-9/11 veterans with a primary diagnosis of combat-related PTSD, demonstrate the high prevalence and significant impact of exposure to loss and associated grief among treatment-seeking veterans. More than three quarters (79.41%) of the overall sample reported an important lifetime loss, with close to half (47.06%) reporting exposure to the loss of a FSM. Regardless of loss exposure, the prevalence of

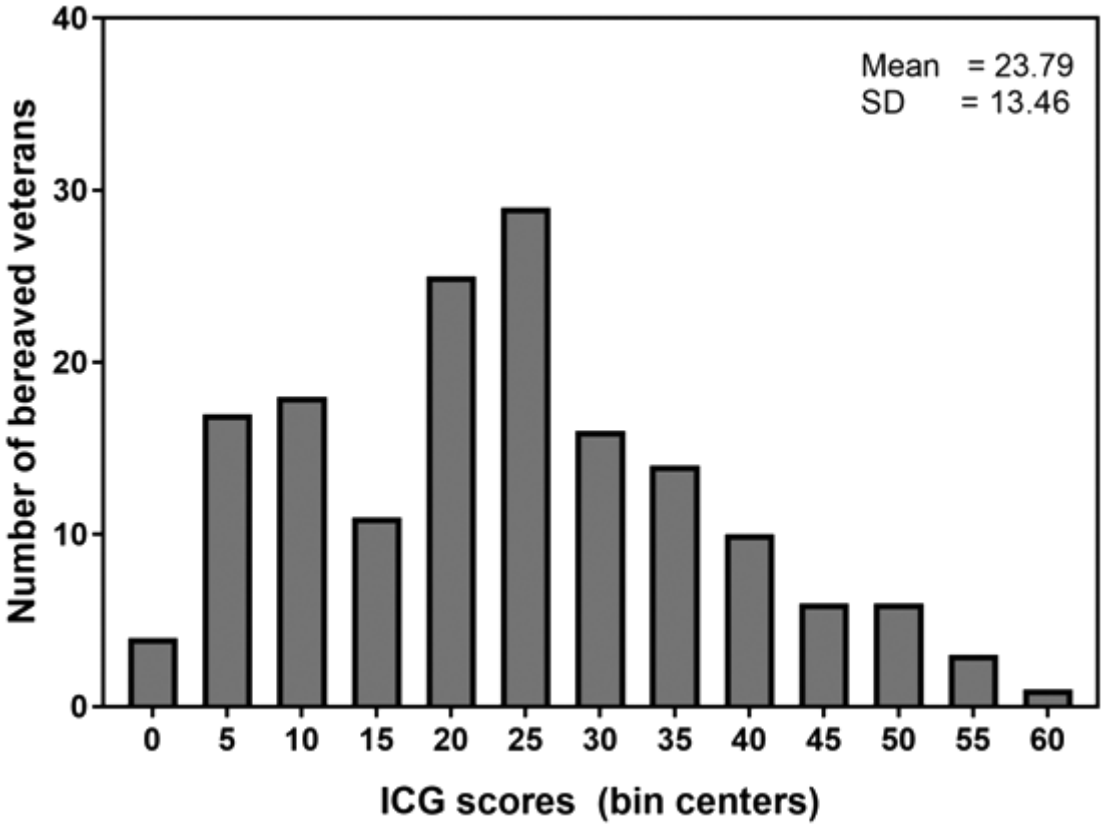

FIGURE 1 Distribution of Inventory of Complicated Grief (ICG) scores for 160 veterans with Posttraumatic Stress Disorders (PTSD) and an important loss. The prevalence of complicated grief (CG) in the combined bereaved and non-bereaved PTSD sample was 24.75%, with 50 bereaved veterans meeting the clinical threshold score for CG (ICG $\geq$ 30).

complicated grief was one in four; among those who reported a loss, the prevalence of CG was nearly one third (31.25%), despite the relative youth of the sample (mean age = 35.03) and the use of a relatively high ICG symptom threshold of 30. Among individuals who lost a FSM, the rate of CG was 41.05%; further, for individuals who reported the loss of a FSM as their most distressing loss, the rate was remarkably high at nearly half (48.23%). Though previously reported CG prevalence rates in general have varied and more epidemiological research is needed, one study of 2,520 individuals aged 14–95 estimated a prevalence of 6.7% in the general population, further highlighting the substantially higher prevalence of CG in this treatment-seeking veteran population with combat-related PTSD (Kersting et al., 2011).

These findings are also consistent with prior reports that suggest elevated prevalence of CG among individuals with mood and anxiety disorders (Marques et al., 2013). For example, among non-military, clinical samples of bereaved adults with major depressive disorder or bipolar disorder, the prevalence of CG was 25% and 24%, respectively (Simon et al., 2005; Sung et al., 2011). Of note, these reports utilized a lower ICG threshold of 25, and we would expect somewhat lower rates of CG had the cut-score of 30 from the present study been used. The high rates of CG in this population of bereaved veterans with PTSD appear especially elevated compared to previously reported rates in other bereaved clinical populations, suggesting they may be particularly at risk. One study using an identical ICG threshold of 30 similarly reported a rate of CG of 27.6% among a non-military bereaved sample with a primary PTSD diagnosis, further supporting the conclusion that individuals with PTSD may be at unique risk for CG (Marques et al., 2013). The present study found a similar overall prevalence of co-occurring CG with PTSD, but much higher prevalence of CG for those with the loss of a FSM. This suggests that bereaved veterans with PTSD who lost a FSM may be a particularly high-risk group for CG even when compared to other clinical populations including non-military populations with PTSD. It is also worth highlighting that in contrast to data suggesting female gender maybe a risk factor for CG and that treatment seeking samples have tended to have higher rates of women, this sample was largely men. More research with larger samples of women veterans and service members with and without combat PTSD is needed to examine whether rates of CG or the impact of the loss of a FSM varies by gender (Kersting et al., 2011; Shear et al., 2016; Shear et al., 2014; Simon et al., 2005).

The overall prevalence of co-occurring conditions was high in this population of veterans with PTSD. CG comorbidity was also linked to greater severity of PTSD as well as higher rates of depression. This is not surprising, given that depression, PTSD, and CG are all disorders that can develop in response to a traumatic life stressor, such as a death, and they fall on a continuum of stress-related syndromes with partially overlapping symptoms and clinical presentations (Bonanno et al., 2007; Simon, 2012; Sung et al., 2011). CG, like depression, may

TABLE 4 Symptoms and functioning of bereaved post-9/11 veterans with and without CG

	Loss without CG M (SD) $N = 110$	Loss with CG M (SD) $N = 50$	Group differences $t(df)$, p
CAPS			
Total Score, past month	75.88 (14.10)	81.56 (14.37)	$t(158) = -2.35$, $p = .02$
PCL-S			
Total Score	57.90 (1.43)	64.67 (11.44)	$t(156) = -3.68$, $p < .01$
Re-experiencing subscale	16.34 (4.01)	18.90 (4.11)	$t(156) = -3.70$, $p < .01$
Avoidance subscale	22.70 (5.15)	25.52 (5.61)	$t(156) = -3.11$, $p < .01$
Hyperarousal subscale	18.87 (3.41)	2.23 (3.35)	$t(156) = -2.34$, $p = .02$
TRGI			
Global Guilt	1.57 (1.19)	2.61 (1.16)	$t(154) = -5.15$, $p < .01$
Distress	2.32 (.73)	2.99 (.71)	$t(155) = -5.42$, $p < .01$
Guilt cognitions[a]	.85 (.65)	1.39 (.83)	$t(76) = -4.03$, $p < .01$
Hindsight bias/responsibility subscale[a]	.67 (.84)	1.38 (1.08)	$t(76) = -4.06$, $p < .01$
Wrongdoing subscale	1.04 (.81)	1.44 (.86)	$t(151) = -2.81$, $p < .01$
Lack of justification subscale	1.57 (1.13)	1.89 (1.21)	$t(150) = -1.62$, $p = .11$
IPF			
Functional Impairment	41.25 (14.03)	47.72 (15.24)	$t(158) = -2.63$, $p < .01$
	***N* (%)**	***N* (%)**	***Z*, *p***
C-SSRS			
Any suicidal ideation, lifetime	43 (41.95)	25 (52.08)	$Z = 1.29$, $p = .24$
Any suicidal ideation, past month	13 (12.38)	8 (16.67)	$Z = .71$, $p = .50$
Any suicide attempts, lifetime	5 (4.81)	7 (14.58)	$Z = 2.08$, $p = .0386$

Measures: Clinician-Administered PTSD Scale (CAPS); PTSD Checklist-Specific Stressor Version (PCL-S); Trauma-Related Guilt Inventory (TRGI); Inventory of Psychosocial Functioning (IPF); Columbia Suicide Severity Rating Scale (C-SSRS).
[a]Two-sample t-tests with unequal variance.

serve as an additional clinical severity marker for individuals with PTSD exposed to a death.

Trauma-related guilt was also greater in those with CG comorbidity; future studies should, in more detail, inquire about guilt-related cognitions and distress and what the individual specifically attributes them to before definitive conclusions about the relative role of specific types of loss and other traumatic events to guilt can be drawn. Nonetheless, this initial finding is consistent with previous studies of veterans that have highlighted the role of guilt and responsibility, including guilt specifically associated with the loss of a combat buddy, highlighting the special bonds formed within units as well as the relationship of those in decision-making roles to those who may die in service (Fontana et al., 1992; Lee, Scragg, & Turner, 2001; Litz et al., 2009; Milgram, 1986; Nazarov et al., 2015). These considerations have become more widely recognized in PTSD treatments as well as highlighted as an aspect of moral injury, which was not assessed in this study (Litz et al., 2009; Nazarov et al., 2015; Norman, Wilkins, Myers, & Allard, 2014; Øktedalen, Hoffart, & Langkaas, 2015; Steenkamp et al., 2011). Further, guilt has also been linked to increased suicidal ideation, particularly among those with direct combat exposure (Bryan, Ray-Sannerud, Morrow, & Etienne, 2013). Contrary to our initial hypotheses, the presence of CG did not influence the rate of lifetime or current suicidal ideation in bereaved veterans. CG was, however, associated with an increased rate of one or more lifetime suicide attempts, although the timing of the suicide attempt in relation to the loss could not be determined. Further, all but one participant with reported lifetime suicide attempts were also diagnosed with depression. It is therefore possible that this finding may be unique to this specific veteran study population and may not generalize to other populations with co-occurring PTSD and CG. A larger sample with more detail about the timing of CG and depression onset as well as suicide attempts may be needed to determine if CG has a unique contribution to increased suicide attempt risk in this population. Prior data have supported increased rates of suicidal ideation and behavior in individuals with CG, and these rates may be even greater among suicide survivors, indicating the need to continue investigations of the relationship between suicide and CG across other populations (Baker et al., 2016; Mitchell, Kim, Prigerson, & Mortimer-Stephens, 2004; Young et al., 2012).

Consistent with prior reports and clinical experience, our data support that the loss of a FSM poses a particular challenge for veterans, and that this type of loss is often reported as the most distressing in post-9/11 veterans. Exposure to loss of a FSM was associated with twice the rate of CG compared to those with other types of losses (41.05% vs. 16.92%). When the loss of a FSM was reported as the most distressing loss, the rate of CG was even higher (48.23%). While it is worth noting that the rates of child and spousal loss were very low

in this relatively young cohort with PTSD and may have contributed to the significantly greater impact of loss of a FSM compared to other types of losses, this does not alter the significance of our finding that high levels of CG symptoms are present following the loss of a FSM among post-9/11 veterans. These data clearly support that veterans seeking care for PTSD should be asked about the loss of a FSM and screened for associated grief symptoms as part of standard evaluations in clinical settings. The identified PTSD-related trauma might not always be the same event as the primary loss. Further, CG after loss can also occur without PTSD, whether the losses occur in war, after terrorist attacks, or in non-violent settings (Morina, Rudari, Bleichhardt, & Prigerson, 2010; Neria et al., 2007; Simon et al., 2007). Many veterans may not raise loss and grief-related concerns about the death of a FSM during their interactions with medical professionals. Further, well-meaning professionals may use terms such as the "loss of a loved one," which may lead to false negatives in screening. Clinicians are encouraged to ask specifically about the loss of a FSM when screening veterans with PTSD. As this population faces many barriers to seeking treatment for mental health concerns in general, efforts to incorporate evaluations of grief-related symptoms into standard clinical care settings should be implemented (Hoge et al., 2004; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009; Sayer et al., 2009; Stecker, Shiner, Watts, Jones, & Conner, 2013).

Findings from this study should be interpreted in light of a number of limitations. First, although the ICG has been used commonly to examine threshold CG symptoms, it carries with it the limitations of any self-report measure. We selected a previously studied threshold score of 30 instead of 25 to assure we were more likely to be detecting a sample with current CG; to date, cut scores for threshold levels of CG using the ICG have varied, with some other studies reporting both somewhat lower or higher cut-off scores (Kersting et al., 2011; Kersting et al., 2009; Ott 2003; Prigerson et al., 2009). Although a structured clinician-rated interview is now available and is recommended for future studies, CG was not confirmed using a structured clinical interview in this study (Bui et al., 2015). While CG has been included as a provisional diagnosis (PCBD) in DSM-5 and substantial evidence supports its inclusion as a diagnosis, final components are still being finalized and more than one proposal exists. Once the diagnosis is finalized in the DSM, a structured interview module should be integrated into diagnostic assessment tools, such as the MINI and Structured Clinical Interview for DSM, to standardize diagnosis (American Psychiatric Association, 2013; Prigerson et al., 2009; Shear et al., 2011). The ICG, however, offers a simple reliable screening tool for clinicians to detect grief symptoms and to monitor change with treatment. Additionally, it is likely that this sample of veterans underreported rather than over-reported their grief symptoms, since they were not seeking care related to grief or asked about grief specifically. We did not collect specific date of loss (only year) and thus, were unable to determine the precise time since the loss. Although a subset of the sample ($n = 40$) had experienced a loss in the past year, it is possible that this loss occurred less than 6 months prior to assessment of grief symptoms for some.

Unfortunately, this analysis also did not include more detail on the relationship of the veteran to the FSM who died such as proximity (e.g., whether the FSM was in the same unit or under the veteran's command) or about the precise nature of the death to examine factors such as whether the loss was due to combat, suicide, or natural causes, or occurred while the veteran was deployed. It would also be important for future studies to have larger samples that could enable study of potential differences by service branch, specific aspects of command culture (e.g., within a unit or battalion), and the handling of deaths during or after deployment, (e.g., differences in opportunities to honor or memorialize the deceased for combat-related versus suicide-related deaths).

Given our sample all met a combat-related PTSD diagnosis and were participating in a treatment study, these data do not address the prevalence of CG related to loss in veterans in general but instead in a higher risk treatment-seeking sample with combat PTSD.

While additional research is needed to fully understand how CG may alter clinical presentation, outcomes, or response to PTSD interventions, these data are among the first to find that the loss of a FSM is very highly associated with CG in a veteran population with PTSD, and demonstrate the additive impact of CG symptoms on psychosocial functioning above and beyond PTSD severity. We encourage clinical providers to screen for loss of a FSM and address associated grief symptoms when working with veterans with combat exposure. Future studies should examine the contribution of concurrent and separately occurring losses on the development of CG symptoms among veterans and service members with PTSD, as well as examine how to optimize treatment outcomes.

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CONFLICT OF INTEREST

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AUTHOR CONTRIBUTIONS

All authors had full access to the data in the study manuscript and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: S.A.M.R., N.S.

Acquisition of data: E.O., M.C., E.B., E.G., A.B., A.R., M.N.V., M.V., N. S., S.A.M.R. Analysis and interpretation of data: S.S.H., S.A.M.R., N. S., H.M.K. Drafting of the manuscript: All authors. Critical revision of the manuscript for important intellectual content: all authors. Statistical analysis: S.S.H., H.M.K. Obtained funding: S.A.M.R., N.S. Administrative, technical, and material support: M.V., E.O., S.N.H., H.M.K. Study supervision: S.A.M.R., N.S.

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