

# Do the Military's Frontline Psychiatry/Combat Operational Stress Control Programs Benefit Veterans? Part Two: Systematic Review of the Evidence

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**Abstract** The second of a three-part review provides the first-ever systematic investigation into the military's claim that its century-old policy of preventing evacuation of psychiatric casualties from war zones is beneficial to the health and well-being of individual service members and their families. We conducted an extensive literature search for studies on the military's frontline psychiatry doctrine, particularly research comparing the differential effects of deployed personnel returned-to-duty (RTD) via frontline psychiatry or combat and operational stress control (COSC) and behavioral health interventions, as opposed to those evacuated out of war zones as psychiatric casualties. In addition, we examined partial and indirect evidence in support of the military's argument that RTD and preventing psychiatric evacuations enhances post-traumatic growth and reduces adverse impact from mental health stigma, shame, and guilt, as well as lowering the risk of developing PTSD or other war stress injury causing premature military discharge. Results indicate support that frontline psychiatry benefits the war-fighting mission and goal of military medicine to prevent psychiatric attrition, with RTD rates of 60 to 100% and severely limiting psychiatric evacuations. However, there is paucity of research on differential outcomes, with only three, small uncontrolled retrospective Israeli studies from the 1982 Lebanon War reporting modest long-term benefit, from frontline versus undefined rear hospital treatment, such as lower PTSD rates. Overall, the review showed insufficient and often contradictory evidence of

individual health benefits from frontline psychiatry, which calls for further research on military's chief mental health policy.

**Keywords** War stress · PTSD · Military · Veterans · Combat stress control · Forward psychiatry · Combat psychiatry · Combat and operational stress control

The two overarching objectives of COSC (combat operational stress control) are to create and preserve a ready force and to promote the long-term health and well-being of individual Marines and Sailors and their family members. The two objectives are interrelated and are recognized as of paramount strategic importance since the mission of the Navy and Marine Corps is to win wars and to return good citizens to civilian life after those wars are fought. (Department of Navy & U.S. Marine Corps, 2010, pp. 1–2).

The second of a three-part review provides the first-ever systematic investigation into the military's claims that its war zone mental health policies of preventing evacuation of psychiatric casualties are mutually beneficial to the military mission as well as the health and well-being of individual service members and their families. We collectively refer to the US military's combat operational stress control (COSC) and behavioral health (BH) programs in war zones as frontline psychiatry (see Russell & Figley, 2016). Readers are referred to our first article for a historical and contemporary review of the debate on frontline psychiatry that became military doctrine during the First World War (WWI) to end mass psychiatric attrition and disability pensions threatening the military's

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capacity to sustain the war effort as well as bankrupting societies (Russell & Figley, 2016). Effectiveness of frontline psychiatry in achieving its explicit goal of conserving the fighting force has traditionally been measured via return-to-duty (RTD) rates and restricting medical evacuations for psychiatric reasons (Russell & Figley, 2016). Over time, however, the military has increasingly justified its century-old mental health policy by messaging frontline psychiatry as mutually beneficial not only to the military mission through conserving the fighting force but also through enhancing the health and well-being of deployed personnel and their families (e.g., Department of the Army, 2006; Russell & Figley, 2016). For example, the Pentagon's top psychiatric advisor at the time was quoted as stating, "If people are treated on the front lines with the expectation that they will go back to duty, they usually recover" (Rabasca, 2000, p. 50) and, conversely, "if we evacuate them away from their unit, their psychiatric symptoms tend to last" (Rabasca, 2000, p. 50).

Periodically, the military's claims are challenged on ethical (e.g., Camp, 2014), scientific (e.g., Jones & Wessely, 2003), and even legal grounds (McGeorge, Hughes, & Wessely, 2006; Russell, Zinn, & Figley, 2016). The most recent challenge came from a 2003 British High Court decision on a class action suit *Multiple Claimants v. MoD* (Ministry of Defense), whereby discharged British soldiers suffering from chronic war stress injury, such as posttraumatic stress disorder (PTSD), alleged wrongdoing because of the MoD's failure to ensure access to preventative frontline psychiatry services (e.g., McGeorge, Hughes, & Wessely, 2006). After extensive review of the empirical evidence on the efficacy of frontline psychiatry, the High Court dismissed the plaintiff's claim by upholding the MoD's argument that frontline psychiatry is generally ineffective in preventing PTSD or other war stress injury (e.g., McGeorge et al., 2006). The High Court even went so far as to question the ethics of the frontline psychiatry doctrine, echoing distant ethical charges of harm from US Army psychiatrists during the Vietnam War (e.g., Camp, 1994).

## Purpose of the Study

The current study provides the first-ever comprehensive evidentiary review of the military's claims that frontline psychiatry is mutually beneficial to the military and its warfighters. After describing our methodology, we begin our analysis with an overview of military organizations responsible for conducting mental health-related research. This is followed by an in-depth analysis of investigations directly assessing research questions regarding the benefits of frontline psychiatry to the military mission. Next, we examine studies directly evaluating differential clinical outcomes between deployed personnel RTD via frontline psychiatry and those medically evacuated for treatment outside war zones. Lastly, we review

indirect evidence of the potential benefit of frontline psychiatry to deployed personnel and their families from multiple lines of research including related to (a) shame, guilt, and stigma caused by psychiatric evacuations and treatment as a psychiatric patient; (b) protective factors of war stress injury, like PTSD, such as unit morale, cohesion, leadership, and social support; (c) promoting resilience by reducing risk of developing chronic war stress injury (like PTSD); (d) preventing adverse personnel actions, including premature military discharge and loss of career; (e) posttraumatic growth (PTG); and (f) increasing positive family outcomes. Central to our analysis is the question: What is the evidence supporting the military's claims of improved short- and long-term outcomes for deployed individuals diagnosed and treated in the war zones for combat stress reaction (CSR)/combat operational stress reaction (COSR) and/or a psychiatric condition(s) as compared to those evacuated and treated outside of war zones?

## Methodology

An extensive review of the literature was conducted on frontline psychiatry since WWI with emphasis on locating primary sources of research relating to assessing effectiveness, efficacy, and clinical outcomes. In addition to multiple historical treatises on the subject (e.g., Dean, 1997; Holden, 1998; Jones, 1995a, b; Jones & Wessely, 2007; Lerner, 2003; Shepard, 2001), we reviewed current US military COSC-related publications (e.g., DOA, 2006; Department of Navy & U.S. Marine Corps, 2010; Department of Veterans Affairs & Department of Defense, 2010) and the US military's documented lessons learned for WWI (e.g., Salmon, 1917; Salmon & Fenton, 1929), Second World War (WWII; Glass, 1966), Korean War (e.g., Ritchie, 2002), Vietnam War (e.g., Camp, 2014), and the Persian Gulf War (e.g., Martin & Cline, 1996), as well as independent government studies (e.g., Institute of Medicine, 2014a; Government Accountability Office, 2016).

With regard to published scientific articles and military reports, an expansive key word search included relevant terms and phrases, such as forward psychiatry, war psychiatry, combat psychiatry, frontline psychiatry, combat stress, neuropsychiatry, combat stress control, combat and operational stress control, acute psychiatric casualties, medical evacuation, and preventative psychiatry, along with specific diagnostic terms (e.g., shell shock, war neuroses, battle fatigue, combat exhaustion, combat stress reaction, PTSD), as it pertains to treatment, prevention, resilience, and protective and risk factors. Specifically, we sought out sources cited by the US military as the evidentiary bases for positing the benefits of frontline psychiatry to service members, but also included research from Australia, Canada, France, Israel, and the UK.

## Military Entities Investigating Mental Health Issues

The Department of Defense (DoD) employs multiple research agencies whose mission involves investigating mental health-related issues including, but not limited to, the following:

In 2007, the USA dramatically increased funding for military mental health research by \$1 billion for 2007 to 2013, including establishing the Psychological Health Research Continuum (PHRC) in 2013 to ensure that deployed personnel receive the best evidence-based prevention, treatment, and care possible (Castro, 2014). As depicted in Table 1, the PHRC represents just the latest in a host of military organizations responsible for researching deployment issues since 1893. Castro's (2014) review of recent military mental health research accomplishments includes prospective longitudinal outcome studies after deployment, clinical trials, epidemiological studies, such as annual Mental Health Advisory Team (MHAT) surveys, as well as studies on etiology, prevention, screening, and follow-up care.

### US Military Research Specific to Frontline Psychiatry Outcomes

Per the Pentagon's top psychiatry advisor during Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) (Ritchie, 2007), "There is an obvious need for research regarding the effectiveness of our early interventions" (p. 14). The senior advisor's frank admission of empirical uncertainty on the matter appears to contradict previous assertive propositions that "If people are treated on the front lines with the expectation that they will go back to duty, they usually recover. But, if we evacuate them away from their unit, their psychiatric symptoms tend to last" (Rabasca, 2000, p. 50). After the past decade of protracted war, what can DoD researchers now tell us about the present state-of-the-knowledge of the health impact from its frontline policies?

Despite the multitude of research agencies whose shared mission is to preserve or improve the mental health of military populations (see Table 1), our literature review failed to identify a single study by the US military on the long-term clinical outcomes for deployed personnel receiving its frontline psychiatry services, let alone any comparative analysis of war stress casualties evacuated out of war zones. Numerous military studies and investigative reports are available since WWI with regard to RTD, relapse, and evacuation rates, as well as surveys of risk and protective factors in the war zones of Iraq and Afghanistan (e.g., MHAT-I, 2003). However, overwhelmingly, those studies address the benefit to the military in terms of preventing psychiatric attrition via evacuations. In fact, the only US research examining clinical outcomes from frontline psychiatry is from a nonmilitary RAND group (Vaughan, Farmer, Breslau, & Burnette, 2015). Consequently, we expanded our literature review to any international investigations, such as by the British MoD and Israeli Defense Forces (IDF).

## Direct Evidence That Frontline Psychiatry Benefits the Military Mission

Since WWI, hundreds of individual and multiple case studies have been published with regard to the US military's claim that frontline psychiatry is beneficial to its mission to fight and win wars by restricting psychiatric evacuations. Historically, the two pivotal outcome measures for directly assessing the efficacy of frontline psychiatry in reducing attrition have been (a) high RTD rate of deployed service members with war stress injury and/or behavioral health (BH) problems, coinciding with (b) low rate of psychiatric evacuations out of war zones.

### Research on Preventing Psychiatric Attrition Prior to Current Afghanistan/Iraq Wars

Table 2 provides a comprehensive analysis of frontline psychiatry from WWI (1914–1918) to the First Persian Gulf War (1990–1991), representing studies by the militaries of Australia, Canada, Israel, France, the UK, and the USA. In this research, the range of RTD is 10 to 100%, with lower rates generally reported by base hospitals and general hospitals farthest from war zones. It is apparent that the reporting of RTD rates is simply a measure of administrative disposition related to the military's explicit bottom line of avoiding psychiatric attrition as opposed to any kind of an assessment of the possible clinical benefits to service members. The net benefit to the military in terms of preserving manpower is notable.

Table 2 also reveals the overall poor quality of empirical support underlying the military's frontline psychiatry doctrine. The historical record is replete with published accounts by military clinicians from every war reporting high RTD rates via frontline interventions in comparison to soldiers treated in the rear (e.g., Noy, Levy, & Solomon, 1984), but sometimes without any statistical data in terms of the number of personnel RTD (e.g., Allerton, 1969), and regularly neglecting durability of intervention effects in terms of relapse rates or clinical outcomes (e.g., Jones & Wessely, 2003).

### Research on Frontline Psychiatry in Current Afghanistan/Iraq Wars

Table 3 contains published reports of the US military's frontline psychiatry programs from the current wars in Afghanistan and Iraq. With the exception of Hoyt et al. (2015), the trend of ignoring the immediate and long-term BH impact from frontline psychiatry interventions has persisted in the twenty-first century. It should be mentioned, however, that Hoyt et al. (2015) do not provide any analysis of clinical outcomes specific to the 467 soldiers RTD or the 46 soldiers psychiatrically

**Table 1** Sample of DoD entities responsible for mental health-related research

Agency	Date of origin	Service branch	Mission	Reference
Walter Reed Army Institute of Research	1893	Army	To conduct biomedical research that is responsive to the Department of Defense and US Army requirements and delivers life-saving products including knowledge, technology, and medical material that sustain the combat effectiveness of the warfighter	<a href="http://wrair-www.army.mil/">http://wrair-www.army.mil/</a>
59th Medical Wing	1941	Air Force	To meet the needs of the Air Force through the development and performance of medical readiness training for expeditionary forces	<a href="http://www.59mdw.af.mil/">http://www.59mdw.af.mil/</a>
U.S. Army Medical Research Materiel Command/Military Operational Medicine Research	1943	Army	Psychological health and resilience research is focused on the prevention, treatment, and recovery of soldiers' and families' behavioral health, which are critical to force health and readiness. Research is necessary to guide policy and ensure optimal delivery of behavioral health training and services across the continuum of care and deployment cycle.	<a href="https://momrp.amedd.army.mil/">https://momrp.amedd.army.mil/</a>
Naval Health Research Center	1959	Navy/Marine Corps	Optimizes the operational health and readiness of our armed forces by conducting research and development to inform DoD policy and practice	<a href="http://www.med.navy.mil/sites/nhrc/Pages/default.aspx">http://www.med.navy.mil/sites/nhrc/Pages/default.aspx</a>
Uniformed Services University of Health Sciences	1972	DoD	To educate, train, and prepare uniformed services health professionals, officers, and leaders to directly support the Military Health System, the National Security and National Defense Strategies of the United States, and the readiness of our Armed Forces	<a href="https://www.usuhs.edu/centers">https://www.usuhs.edu/centers</a>
Center for Study of Traumatic Stress	1987	DoD	Develops and carries out research programs to extend our knowledge of the medical and psychiatric consequences of war, deployment, trauma, disaster, and terrorism, including weapons of mass destruction	<a href="http://www.cstsonline.org/">http://www.cstsonline.org/</a>
Congressionally Directed Medical Research Programs	1992	DoD	To transform healthcare for Service Members and the American public through innovative and impactful research	<a href="http://cdmrp.army.mil/">http://cdmrp.army.mil/</a>
Deployment Health Clinical Center	1994	DoD	To advance excellence in psychological healthcare across the Military Health System by enhancing care quality, effectiveness, and efficiencies; facilitating the translation of research to practice; and providing leadership, advocacy, and implementation support	<a href="http://www.pdhealth.mil/">http://www.pdhealth.mil/</a>
Combat Casualty Care Research Program	2001	Army	To drive medical innovation through the development of knowledge and materiel solutions for the acute and early management of combat-related trauma, including point-of-injury, en route, and facility-based care	<a href="https://ccc.amedd.army.mil/Pages/default.aspx">https://ccc.amedd.army.mil/Pages/default.aspx</a>
Consortium for Health and Military Performance	2006	DoD	To conduct and translate basic and clinical research in military human performance, so as to inform the development of educational products, clinical products, clinical care pathways, operational guidelines, and health policies	<a href="https://www.usuhs.edu/mem/champ">https://www.usuhs.edu/mem/champ</a>
Psychological Health/Traumatic Brain Injury Research Program	2007	DoD	Establish, fund, and integrate both individual and multi-agency research efforts that will lead to improved prevention, detection, and treatment of PH/TBI	<a href="http://cdmrp.army.mil/phtbi/default.shtml">http://cdmrp.army.mil/phtbi/default.shtml</a>
Center for Rehabilitation Sciences Research	2011	DoD	To advance the rehabilitative care for service members with combat-related injuries	<a href="http://csr.org/#/">http://csr.org/#/</a>

evacuated even though assigned to the same Army unit. This reflects a missed opportunity to evaluate the accuracy of the military's narrative of the clinical benefit of frontline psychiatry. Nevertheless, Tables 2 and 3 provide convincing proof that frontline psychiatry is extremely effective in conserving the fighting force via its RTD policy.

### Current Research on Psychiatric Evacuations out of War Zones

As evident in Tables 2 and 3, for the past 100 years, frontline psychiatry has proven to be highly effective in ensuring low rates of psychiatric evacuations as compared to medical

**Table 2** Research on frontline psychiatry/COSC effectiveness in preventing psychiatric attrition

Study	War	Sample	Treatment setting	% RTD
Wiltshire (1916)	WWI	<i>N</i> = 150 UK soldiers with shell shock	General hospital in France	No data
Brown (1919)	WWI	<i>N</i> = 22 UK soldiers treated with light hypnosis	Hospital in France war zone	70–90% overall; 66% of treatment sample for amnesia ( <i>n</i> = 15)
L'eri (1919)	WWI	<i>N</i> = 600 French soldiers treated in 1916; <i>N</i> = 4000 treated 1916–1919	2nd Army in France	91%
Russel (1919)	WWI	<i>N</i> = 132 Canadian soldiers admitted to specialty hospital in August 1917	Canadian Stationary hospital in France	100%
Strecker (1919)	WWI	<i>N</i> = 1341 admitted 4 months in 1917	Hospital in France within artillery range. 4-day average	No data
Johnson and Rows (1923)	WWI	<i>N</i> = 400 US military	NYDN Centre 5th Army in 1917	65–75%
Dillon (1939)	WWI	<i>N</i> = 5000 UK soldiers admitted with shell shock	NYDN Centre for 3rd Army at 6 Stationary Hospital in 1918	55% to combat units
Cooper and Sinclair (1942)	WWII	<i>N</i> = 4235 UK soldiers	War neuroses clinic in Tobruk during 1941	64%
Grinker and Spiegel (1943)	WWII	<i>N</i> = 207 Australian soldiers	95th General Hospital North Africa in 1943	80% overall
Bartemeier, Kubie, Meminger, Romano, and Whitehorn (1946)	WWII	<i>N</i> = 1720 US military	Battalion Aide Station	– 33% ( <i>n</i> = 79) combat
Hunter (1946)	WWII	US Army	– Clearing Station	– 68% ( <i>n</i> = 48) reassigned
Glass (1947)	WWII	No data on sample size	– Specialty hospital out of war zone	53% overall <i>n</i> = 909
Ludwig and Ranson (1947)	WWII	<i>N</i> = 50 UK soldiers in 1943	– General psychiatric hospital	– Estimated 2% RTD combat duty
Hanson and Ranson (1949)	WWII	<i>N</i> = 393 US military	Forward psychiatric center in Italy <4 days	50%
Ludwig and Ranson (1947)	WWII	<i>N</i> = 346 US military randomly selected who were RTD to combat units	Division neuropsychiatric unit during Apennines Campaign in 1945	50–60%
Hanson and Ranson (1949)	WWII	<i>N</i> = 18,255 US military admitted; <i>n</i> = 10,350 from combat units and <i>n</i> = 7905 from noncombat units	Forward psychiatric centers	80%
Ludwig and Ranson (1947)	WWII	<i>N</i> = no data on numbers of US military referred from divisions	Mediterranean hospital in 1945	30%
Brill and Beebe (1952)	WWII	<i>N</i> = 955 US military: <i>M</i> = 13 months active duty, <i>M</i> = 4.1 months combat	Psychiatric treatment centers for 5th Army Italy and 7th Army France	30% RTD to combat units; 60% reassigned
Gordon (1967)	Vietnam	<i>N</i> = 1000 US military	Forward psychiatric centers (preservice personality factors assessed)	54% overall
Allerton (1969)	Vietnam	US Army	1st Infantry Division forward psychiatry unit in 1967	– 30% to combat units
Strange (1969)	Vietnam	No stats reported; summary of field reports	Army division psychiatry, field, and evacuation hospitals	68% returned to combat
		<i>N</i> = US military no statistic reported;	Navy hospital ship off Vietnam in 1966	72% overall ( <i>n</i> = 13,175):
				– 81% ( <i>n</i> = 8365) from combat
				– 26% ( <i>n</i> = 2698) combat duty
				– 55% ( <i>n</i> = 5667) limited service
				31% 5th Army; 24% 7th Army
				26% of “normal” personality; 14% with neurotic traits; 13% suggestive neuroses; 10% overt neuroses
				98% ( <i>n</i> = 976):
				– 91% ( <i>n</i> = 908) to units
				– 7% ( <i>n</i> = 68) reassigned
				95% 1965–1966; 97–98% 1967–1968
				62% diagnosed with psychiatric diagnosis

**Table 2** (continued)

Study	War	Sample	Treatment setting	% RTD		
Noy et al. (1984)	1982 Lebanon	70% Marine 30% Navy N = no data reported on number of Israeli soldiers	Forward treatment compared to rearward treatment in Israel	78% combat exhaustion cases		
Holsenbeck (1996)	Gulf War	N = 514 US military	Army Psych Force 90 528th Medical CSC in 1990–1991	60% RTD to combat units from forward treatment 40% RTD from rearward hospital 96% overall (n = 496) – 24% admitted (n = 124) – 85% of those admitted (n = 106)		
Ruck (1996)	Gulf War	N = 108 US military	18th Airborne Corps OM Team in 1990–1991	96% (n = 104) – 64% n = 7 of 11 admitted to base hospital		
Jones and Palmer (2000) Ritchie (2002)	Korea Korea	N = 483 Canadian soldiers N = US military; no data reported; summary of field reports	25 Canadian Field Dressing Station in Korea Forward treatment in Korea 1951–1953	50% RTD 50–60% (1950); 90% (1951); 65–90% (1952–1953)		
Study	War	% Relapse	Evacuated outside the war zone	Psychiatric treatment outcomes after evacuation	Postdeployment/long-term outcomes	Limitations
Wiltshire (1916)	WWI	27% (n = 41)	No data	No data	No data	No controls Small sample No objective measures
Brown (1919)	WWI	0.04% (n = 1)	0.04% (n = 1)	No data	No data	No follow-up Missing outcome data on 6 of 22 soldiers treated for amnesia on frontline
L’eri (1919)	WWI	No data	No data	No data	No data	Small sample No measures No objective measures No outcome data other than RTD
Russel (1919)	WWI	73% RTD (n = 96) – 85% shell shock – 57% neurasthenia 27% to base (n = 36) 79% RTD (n = 938) 21% (n = 235)–base 4%	10–15% overall evacuated to England	No data	N = 39 psychogenetic disability; M = 15 months hospital admission prior to discharge and disability pension	No controls No objective measures Small sample
Strecker (1919)	WWI	No data	No data	No data	No data	No objective measures; statistical records lost; biased self report recall No follow-up
Johnson and Rows (1923)	WWI	No data	No data	No data	No data	No objective measures No outcome data other than RTD
Dillon (1939)	WWI	No data	No data	No data	No data	No controls No objective measures No outcome data other than RTD

Table 2 (continued)

Study	War	% Relapse	% Evacuated outside the war zone	Psychiatric treatment outcomes after evacuation	Postdeployment/long-term outcomes	Limitations
Cooper and Sinclair (1942)	WWII	No data	23% ( $n = 48$ ) evacuated to base	No data	No data	No objective measures No clinical outcomes No follow-up
Grinker and Spiegel (1943)	WWII	No data	26% ( $n = 450$ )	No data	No data	No objective measures No control
Bartemeier, Kubie, Menninger, Romano, and Whitehorn (1946)	WWII	No data	5% overall	No data	No data	No follow-up No statistical reporting; no objective measures
Hunter (1946)	WWII	No data	<10%	No data	No data	No outcome data other than RTD No follow up
Glass (1947)	WWII	2/3 of those relapsing via other routes (e.g., disease, injury or military offense)	46%	No data	No data	No objective measures Small sample No follow-up No controls
Ludwig and Ranson (1947)	WWII	24% ( $n = 51$ ) relapsed as psychiatric patients	9.7% ( $n = 21$ )	38.6% of RTD performed well in combat; 12% legal misconduct; 2% KIA; 9% WIA; 11% reassigned in division; .9% self-inflicted wound	No data	No objective measures No outcome data other than RTD Relied on self-report No objective measures No follow-up
Hanson and Ranson (1949)	WWII	No data	28% overall ( $n = 5801$ ): – 19% ( $n = 1986$ ) combat units – 39% ( $n = 3095$ ) noncombat units	No data	No data	No objective measures No clinical outcomes No control group No follow-up
Ludwig and Ranson (1947)	WWII	13% 5th Army; 28% 7th Army	No data	No data	No data	No statistical reporting No objective measures
Brill and Beebe (1952)	WWII	38.5% “normal” admitted after breakdown; 57.5% “neurotic”; 51% “suggestive” neuroses; 69.6% overt neuroses	21% of “normal” personality types	No data	5-year follow-up after military treatment; 7% unemployment; 38.5% military discharge after first hospitalization; 57.5% “neurotic”; 51% “suggestive neuroses”; 69.6% overt neuroses	No objective measures No outcome data other than RTD Selection bias in sample Retrospective assessment of preservice personality No clinical outcomes
Gordon (1967)	Vietnam	No data	2.4% ( $n = 24$ )	No data	No data	No objective measures No clinical outcomes
Allerton (1969)	Vietnam	No data	5% 1965–1966; 2–3% 1967–1968	No data	No data	No follow-up No statistical reporting No objective measures

**Table 2** (continued)

Study	War	% Relapse	% Evacuated outside the war zone	Psychiatric treatment outcomes after evacuation	Postdeployment/long-term outcomes	Limitations
Strange (1969)	Vietnam	No data	38% out of theater hospital	No data	No data	No outcome data other than RTD No statistical reporting No objective measures No outcome data other than RTD Nonrandom allocation
Noy et al. (1984)	1982 Lebanon	No data	40% evacuated to rearward treatment in Israel	40% to combat units	No data	No statistical reporting No objective measures No outcome data other than RTD Nonrandom allocation No follow-up undertaken to investigate relapses; patients not categorized by military role
Holsenbeck (1996)	Gulf War	No data	3.5% ( $n = 18$ ) of soldiers admitted	No data	No data	No objective measures No outcome data other than RTD
Ruck (1996)	Gulf War	No data	3.7% ( $n = 4$ )	No data	No data	No objective measures No outcome data other than RTD
Jones and Palmer (2000)	Korea	No data	30% evacuated to Japan	No data	No data	No controls No objective measures No outcome data other than RTD
Ritchie (2002)	Korea	5–10% estimated “repeaters” 1951–1953	$n = 1800$ to Japan in 1950 before frontline psychiatry	No data	No data	No objective measures No outcome data other than RTD No statistical reporting No objective measures No outcome data other than RTD

evacuations, thereby achieving the stated goal of avoiding evacuation syndromes. Table 4 summarizes contemporary studies on psychiatric evacuations and shows that about only 7–10% of all evacuations from war zones in Afghanistan and Iraq are due to psychiatric reasons. The primary focus of the military's evacuation research is extensively concerned with administrative disposition, like categorical designation and RTD rates, as opposed to clinical outcomes.

For example, Rundell's (2006) retrospective analysis of 12,480 US military personnel medically evacuated to Landstuhl Germany out of Iraq and Afghanistan theaters, between November 4, 2001, and July 30, 2004, revealed that 1264 or 10% of evacuations were for psychiatric conditions. The most frequent psychiatric diagnostic categories were adjustment disorders (34%), mood disorders (22%), personality disorders (16%), anxiety disorders (15%), no diagnosis (16%), and psychotic disorders (6%; Rundell, 2006). After psychiatric hospitalization at Landstuhl, most patients (81%) were sent back to their home stations for outpatient mental health treatment and 14% were transferred to other inpatient psychiatric settings. The long-term clinical and administrative (i.e., military discharge or retention) rates are unreported (Rundell, 2006). The author emphasized that only 5% of psychiatric evacuees were RTD to frontline units after treatment at Landstuhl (Rundell, 2006). No information on treatment or clinical outcomes is reported (Rundell, 2006). However, Rundell (2006) does offer possible explanations about why a meager 5% of war-stressed personnel were returned to the war zone. He noted that the assumption is that the service member already had "significant mental health intervention" (p. 355). He added that without providing data, evacuated service members start to "reconstitute" in a manner preventing "assimilation" into the war theater (p. 355). In conclusion, Rundell (2006) opined, "As in prior wars, it appears that rapid reconstitution of psychiatric patients must be accomplished as near to the area of operations as possible to facilitate a reasonable chance of return to combat or combat support duty" (p. 355). The assumption is that RTD is an empirically informed measure for favorable long-term clinical prognosis, while psychiatric evacuation is generally therapeutically harmful. However, none of the studies in Table 4 describe long-term clinical outcomes of war zone psychiatric evacuees or offer any comparison with counterparts RTD via frontline psychiatry.

Likewise, Cohen et al. (2010) analyzed the medical reasons and RTD rates of 34,006 US military personnel evacuated out of OIF/OEF war zones to Landstuhl Germany from January 2004 to December 2007. Most common categories for medical evacuation were musculoskeletal and connective tissue disorders ( $n = 8104$  service members, 24% of total evacuations), combat injuries ( $n = 4713$ , 14%), neurological disorders ( $n = 3502$ , 10%), psychiatric diagnoses ( $n = 3108$ , 9%), and spinal pain ( $n = 2445$ , 7%; Cohen et al., 2010). The factors

most strongly associated with RTD were being a senior officer, having a nonbattle-related injury or disease, and presenting with chest or abdominal pain, a gastrointestinal disorder, or a genitourinary disorder (Cohen et al., 2010). Conversely, decreased probability of RTD was related to serving in the Navy, Coast Guard, or Marines and presenting with a combat injury, a psychiatric disorder, musculoskeletal or connective tissue disorder, spinal pain, or other medical wounds (Cohen et al., 2010). Nearly all (96%) of service members evacuated for a physical battle injury were not RTD (Cohen et al., 2010). According to Cohen et al. (2010), 9% of military personnel evacuated for psychiatric reasons were RTD to war zones, including 31 combatants previously diagnosed with TBI, 72 with stress reactions, 13 with substance abuse, 67 with depression or bipolar disorder, and 88 with another type of mental disorder. No treatment data, clinical outcomes, or long-term follow-up were reported for either the 271 psychiatric evacuees RTD or the 2837 service members transported to state-side treatment facilities.

### Anecdotal Validation of Frontline PIE/BICEPS Principles

Historical overviews of managing war stress in the military's official policy instructions (e.g., DOA, 2006) and medical textbooks (e.g., Jones, 1995a), universally refer to repeated validation of frontline psychiatry principles through the unintended consequences of failure to learn from past war trauma lessons by neglecting frontline psychiatry (e.g., Jones, 1995a; p. 16). Wartime mental health crises in the form of massive psychiatric attrition via evacuation syndromes are regularly attributed by the military to its initial failure in implementing frontline psychiatry PIE (proximity, immediacy, and expectancy)/BICEP principles at the outset of WWI (e.g., Salmon & Fenton, 1929), WWII (e.g., Glass, 1966), Korean War (e.g., Jones, 1995a), and the 1973 Arab-Israeli Wars (e.g., Belenky, Tyner, & Sodetz, 1983). In each periodic war, the military reports eventually *rediscovering* the validity of frontline psychiatry as confirmed by dramatic improvements in RTD rates and significant reduction in psychiatric evacuations (e.g., Belenky et al., 1983; Ritchie, 2002). For instance, during the Korean War, after initially evacuating 100% of war stress casualties, frontline psychiatry was reinstated to prevent further psychiatric attrition (Jones, 1995a, p. 16). Consequently, validation of the frontline psychiatry doctrine is reported in terms of military-related versus individual clinical outcomes as in the following: "Psychiatric casualties accounted for only about 5% of medical out-of-country evacuations, and some of these (treated in Japan) were returned to the combat zone" (Jones, 1995a, p. 16).

In sum, conclusions about the efficacy of frontline psychiatry is in the research conducted to date mostly from the

perspective of the logistical benefits to the military and its desired outcome of preserving the fighting force by avoiding psychiatric attrition (i.e., RTD). To that end, there is sufficient evidence that the military profits from frontline psychiatry. At the same time, none of the studies reviewed thus far remotely addresses questions around the health and well-being of deployed service members experiencing war stress injury or other behavioral health disorder, who are compelled by a RTD policy to endure repeated war stress exposure.

### Does Frontline Psychiatry Enhance the Well-Being of Deployed Personnel and Families?

Recent arguments used to justify the military's frontline psychiatry policy center around the premise that preventing psychiatric attrition via RTD maintains protective factors (see Russell & Figley, 2016). Conversely, the military posits that research has allegedly shown poorer administrative and clinical outcomes for service members psychiatrically evacuated and treated outside the war zone (Martin & Cline, 1996, p. 164). However, is there empirical support for proof of the military's assertions of the health-promoting benefits from its frontline psychiatry policies?

### Direct Empirical Evidence of Frontline Psychiatry's Health Benefit

Table 5 contains the results from an exhaustive search of a century-old body of frontline psychiatry literature. Inclusion criteria for the research were related to any investigation comparing any immediate and/or long-term outcomes (other than RTD) of deployed personnel RTD via frontline psychiatry versus those evacuated and treated outside the war zone. Results of our search yielded only three small retrospective studies by the IDF comparing clinical outcomes (PTSD rates) between groups of combat veterans RTD versus those evacuated to Israeli hospitals during the 1982 Lebanon War. More accurately, the three IDF publications represent a single longitudinal study starting with the initial report (Solomon & Benbenishty, 1986) and a follow-up analyses at 1 year (Solomon, Weisenberg, Schwarzwald, & Mikulincer, 1987) and at 20 years (Solomon, Shklar, & Mikulincer, 2005).

The IDF research provides the only direct assessment of the military's health benefit claims, thereby constituting the only known empirical foundation for the DoD's frontline mental health policies. However, that research was conducted in a country with a military draft and with the vital role of the military in the culture of the country acknowledged. In this sense, generalizations from that research to the contemporary American context must be made with caution.

### IDF Research on Longitudinal Effects from Frontline Psychiatry

Solomon and Benbenishty's (1986) paper reported the RTD and PTSD rates of an unspecified number of Israeli soldiers treated for CSR 1 year after the 1982 Lebanon War (the results included only relevant percentages). The sample was divided into three groups: (a) veterans treated within the war zone via frontline PIE interventions, (b) veterans evacuated and treated at general hospitals in Israel, and (c) veterans seeking mental health treatment after the war. Results indicated that being diagnosed with CSR was significantly related to developing PTSD regardless of treatment group. In other words, there was no overall significant difference in clinical outcomes between veterans treated by frontline PIE programs or the other conditions. However, veterans receiving frontline psychiatry were reported to have significantly lower PTSD rates than evacuees (Solomon & Benbenishty, 1986). This finding appears to lend direct support for the military's health benefit claims.

However, aside from the methodological issue of unreported *N*s, evacuated veterans with CSR were sent to general civilian hospitals and not to specialized military treatment facilities, and no details of treatment are provided. Therefore, it is impossible to know if higher PTSD rates in evacuees represent a by-product of inadequate hospital treatment or actual evidence of the psychiatric harm caused by evacuation. Moreover, as the authors rightly point out, major methodological flaws seriously limit the weight attributed to the research findings aside from the obvious limitations of relying upon 1-year retrospective self-reports and nonrandomized treatment group assignment. For instance, the researchers were unable to assess CSR severity levels at the time of triage leading to decisions regarding evacuation (Solomon & Benbenishty, 1986). Consequently, in this study, it is entirely possible that evacuated veterans represented a more impaired group than those RTD.

### Reported Dose-Response Benefit from Frontline Psychiatry PIE Principles

In Solomon and Benbenishty (1986), an effort was made to empirically test the validity of core tenets of frontline psychiatry: veterans RTD via frontline psychiatry were asked to retrospectively report how many of the frontline PIE principles they received 1 year prior. The authors found no statistically significant benefit in the number of PIE principles applied, but reported a modest cumulative trend whereby lower PTSD rates were associated with more PIE principles applied. For example, 71% of soldiers RTD who received no PIE-related intervention developed PTSD within 1 year after the war, in contrast to a 40% PTSD rate if veterans RTD received all three principles (Solomon & Benbenishty, 1986).

**Table 3** Frontline psychiatry workload and outcome data during Afghanistan and Iraq wars

Source	Deployment	Total numbers receiving COSC/BH	Number (%) of RTD in war zone	Number (%) of relapse in war zone	Number (%) of psychiatric evacuations out of war zone	Number (%) receiving BH treatment in war zone	Deployment outcomes after BH treatment in war zone	Postdeployment outcomes of personnel RTD via frontline psychiatry	Postdeployment outcomes for personnel evacuated for psychiatric condition
MHAT-I (2003)	Iraq 2002–2003	3312 US military	2643 (80–97%)	No data	<i>n</i> = 669 (20%) <i>n</i> = 440 (13%) excluding Kuwait	No data	No data	No data	RTD 36 of 508 (7%) No other outcome data
MHAT-II (2005)	Iraq	No data	No data (80–100%)	No data	No data	No data	No data	No data	No data
Scott (2005)	Iraq	170 UK soldiers receiving PIE at FMHT Field Hospital	<i>N</i> = 123 (72%) – <i>n</i> = 109 adjustment disorder – <i>n</i> = 8 somatoform disorder – <i>n</i> = 1 generalized anxiety – <i>n</i> = 1 harmful alcohol use – <i>n</i> = 2 delirium – <i>n</i> = 1 phobia – <i>n</i> = 1 PTSD	<i>N</i> = 3	<i>N</i> = 47 (28%) – <i>n</i> = 23 major depression – <i>n</i> = 7 intentional self-harm – <i>n</i> = 7 adjustment disorder – <i>n</i> = 4 generalized anxiety – <i>n</i> = 2 harmful alcohol use – <i>n</i> = 1 phobia – <i>n</i> = 1 PTSD – <i>n</i> = 1 dissociation – <i>n</i> = 1 hypomania	No data	No data	No data	No data
Hung (2008)	Iraq First 6 months of 2008	<i>N</i> = 49,770 Retrospective review of disposition via COSC Workload and Activity Reporting System (COSC-WARS)	Overall, 99% RTD 90.8% ( <i>n</i> = 45,100) RTD without limitations; 4.4% ( <i>n</i> = 2185) RTD with limitations; 3.4% ( <i>n</i> = 1700) “rest” (sent to a nonmedical support unit, typically farther from the frontlines); 0.91% ( <i>n</i> = 450) “referred” to a higher level of medical care in theater	No data	<i>n</i> = 5871 Psychiatric diagnoses: Depression ( <i>n</i> = 1389) Anxiety ( <i>n</i> = 928) Nicotine problem ( <i>n</i> = 1002) ASD/PTSD ( <i>n</i> = 720) Substance abuse ( <i>n</i> = 192) Other problem ( <i>n</i> = 1640)	99.3% No data on relapse or clinical outcomes	No data	No data	No data
Potter, Baker, Sanders, and Peterson (2009)	Iraq War	<i>N</i> = 57 US military personnel referred to a 2-day restoration center in Iraq	100% RTD for (no data) treatment completers; 67%	No data	No data	No data	No data	No data	Lack random assignment; no controls; selection bias; high noncompleter rate

**Table 3** (continued)

Source	Deployment	Total numbers receiving COSC/BH	Number (%) of RTD in war zone	Number (%) of relapse in war zone	Number (%) of psychiatric evacuations out of war zone	Number (%) receiving BH treatment in war zone	Deployment outcomes after BH treatment in war zone	Postdeployment outcomes of personnel RTD via frontline psychiatry	Postdeployment outcomes for personnel evacuated for psychiatric condition
		<i>N</i> = 38 (67%) completed the 2-day program <i>N</i> = 19 did not complete either RTD early, medically evacuated, or required extended treatment	RTD for total sample						No postdeployment outcome data beyond RTD status No comparison of RTD vs. evacuation group
Ogle, Bradley, and Reynolds (2012)	Afghanistan, 12 months deploy to Regional Command East	16,000 US military individual appointments for COSC and/or BH	No data (99.2%)	No data	(0.8%)	About 9560 individual appointments for BH	No data	No data for personnel receiving COSC/BH during deployment	No data
Hoyt et al. (2015)	Afghanistan 9 months deploy with 4000 member Army Stryker Brigade Combat Team	No data	467 (97%)—BH only	No data	46 (8%)	513 (13%)	97%—RTD	No data for personnel receiving COSC/BH during deployment 719 of 3284 (21%) brigade members screened before returning home as moderate to high risk 364 sought BH care in garrison and 19 admitted psychiatric hospitalizations—no outcome data 158 referred to BH after positive screening on 90–180-day reassessment	No data

However, caution is warranted in drawing conclusions about the efficacy of PIE principles in this research. Perhaps most importantly, the reported trend, while generally lending positive support for frontline psychiatry, did not reach statistical significance. More than half (52%) of those RTD via frontline psychiatry developed PTSD within a year as compared to 66% of soldiers evacuated to a general, nonmilitary hospital (Solomon & Benbenishty, 1986). With regard to the principle of expectancy of RTD, there was no statistically significant difference of PTSD rates, in that 55% to 62% of soldiers RTD were eventually diagnosed with PTSD (Solomon & Benbenishty, 1986). Moreover, the type and quality of hospitalized psychiatric treatment of evacuees was not reported, thereby limiting any conclusion about the comparative benefit from frontline interventions and evacuees. Regardless of the study's lack of rigor, the initial IDF findings provide at least tacit, provisional support for frontline psychiatry's purported health benefits that would have benefited had the US military conducted further research.

### **1987 IDF Research of Frontline Psychiatry's Health Benefits**

The second IDF study compared outcomes from both frontline psychiatry and psychiatric evacuations and involved a total of 470 Israeli veterans 1 year after the 1982 Lebanon War (Solomon, Weisenberg, Schwarzwald, et al., 1987). Per Table 5, 155 combat veterans who received frontline PIE treatment for CSR were compared to 315 veterans evacuated to rear hospitals for treatment of CSR, matched to a control group of 334 veterans without a diagnosed CSR (Solomon, Weisenberg, Schwarzwald, et al., 1987). Results indicated that there were no significant differences in clinical outcomes between groups of veterans with CSR, whether treated at the frontline or in rear hospitals. In other words, experiencing CSR significantly increased a veteran's risk of subsequent PTSD diagnosis regardless of treatment setting. Specifically, 59% ( $n = 255$ ) of soldiers in the two CSR groups (frontline psychiatry and evacuees), as well as 16% ( $n = 53$ ) of veterans in the control group, went on to develop PTSD within a year after the war. Identical scientific limitations exist in this study as found in the previous IDF study, which prohibits any firm conclusions regarding frontline psychiatry efficacy.

### **2005 IDF 20-Year Follow-Up on Long-Term Health Benefits from Frontline Psychiatry**

The last published report on the purported health benefits from frontline psychiatry is a 20-year retrospective reanalysis of the previous IDF studies (Solomon et al., 2005). Solomon et al. (2005) compared 79 veterans diagnosed with CSR who were RTD after receiving frontline intervention with 156 veterans with CSR who were evacuated and treated at rear hospitals,

matched to 196 veterans with no documented history of CSR in the war zone (Solomon et al., 2005). Veterans RTD via frontline psychiatry were also asked to retrospectively recall whether the frontline treatment they received included the PIE principles, replicating the authors' 1986 study (Solomon & Benbenishty, 1986). In addition, veterans were asked to retrospectively recall whether they felt recovered from their CSR prior to being RTD (Solomon et al., 2005). Results of the analysis comparing veterans RTD after frontline psychiatry versus those evacuated revealed no significant differences with regard to PTSD diagnosis, that is, in the two target groups, 30% (frontline psychiatry) and 41% (evacuated) of veterans were later diagnosed with PTSD, which are percentages that are significantly higher than the one for the control group (Solomon et al., 2005). Interestingly, 14% of veterans in the control group also developed PTSD (Solomon et al., 2005). Secondary analysis indicated that veterans in the frontline treatment group reported significantly more intrusion and hyperarousal symptoms than those who had been evacuated. However, there were no significant differences between frontline psychiatry and rear echelon treatment on a diverse range of outcomes, including avoidance symptoms, global symptoms of distress, loneliness, perceived social support, interpersonal functioning, and occupational functioning (Solomon et al., 2005). In their retrospective analysis of PIE principles, Solomon et al. (2005) concluded the presence of a nonsignificant, modest dose-response relationship between lower rates of PTSD diagnosis and the number of PIE principles applied (Solomon & Benbenishty, 1986). For instance, a 25% PTSD rate was found when all three PIE principles were applied compared to 32.6% with two principles, 38.5% one principle, and 49.7% with no principles (Solomon et al., 2005). CSR casualties who felt their RTD was premature reported 50% more PTSD symptoms than those RTD after feeling completely recovered (Solomon et al., 2005). However, the researchers reiterated that the serious methodological flaws mentioned earlier prohibited any causal inferences associated with RTD and evacuation status. Furthermore, the cultural differences in the Israeli and American military context limit generalizations, as indicated.

### **Summary of Direct Empirical Testing of Frontline Psychiatry Health Benefits**

Despite the limitations of the IDF research for the contemporary American context, some implications can be considered because, although methodologically flawed, the IDF research offers the only direct assessment of frontline psychiatry's central tenets. In that research, a modest but nonsignificant trend was replicated, whereby lower PTSD rates were linearly associated with the number of applied PIE principles, giving tentative support for frontline interventions (e.g., Solomon et al., 2005). However, two of three of the IDF's head-to-head

**Table 4** Current research of medical evacuations from Afghanistan and Iraq war zones

Study	Sample of medical evacuations	Number of (%) psychiatric evacuations	Primary psychiatric diagnosis	Number (%) receiving frontline COSC/BH initial RTD	Number (%) of relapse after deployment	Number (%) with psychiatric diagnosis before deployment	Number (%) on >1 deployment	Number (%) receiving definitive MH treatment after evacuation	Administrative disposition (e.g., RTD, retention in military, or military discharge)
Harman, Hooper, and Gackstetter (2005)	<i>N</i> = 11,183 US military evacuated out of Iraq in 2003	<i>n</i> = 769 (7%)		No data	No data	No data	No data	No data	No data
Stetz, McDonald, Lukey, and Gifford (2005)	<i>N</i> = 12,480 US military evacuated from Iraq and Afghanistan	<i>n</i> = 386 (7%)	73 (19%) with psychotic disorders and 242 (63%) with nonpsychotic disorders Sixty (15%) had DSM-IV V-codes or had a deferred diagnosis pending further evaluation; suicidal ideations and self-injurious behaviors accounted for about 3% of the cases	No data	No data	No data	No data	No data	No data
Turner et al. (2005)	<i>N</i> = 2009 UK military evacuated to UK from Iraq in 2003	<i>n</i> = 178 (9%) <i>n</i> = 117 admitted to UK hospital	91 (78%) depression 14 (12%) anxiety 4 (3%) somatic 2 (2%) delusion Adjustment disorders (34%)	No data	48% ( <i>n</i> = 8-5)	37% prior contact with mental health	No data	No data <i>M</i> = 1.4 days stay in hospital	34% RTD <i>n</i> = 61 No clinical outcomes
Rundell (2006)	<i>N</i> = 12,480 US military evacuated to Landstuhl Army Medical Center in Germany from OIF/OEF between November 4, 2001, to July 30, 2004	<i>n</i> = 1264 (10%) 49% evacuated during the first 3 months of deployment, 33% during the second 3 months	Mood disorders (22%) Personality disorders (16%) Anxiety disorders (15%) ASD (36%) PTSD (29%) Psychotic (6%) Bipolar disorder (4%) or substance abuse disorder (5%)	No data	No data	No data	No data	81% evacuated back to the USA for outpatient follow-up 14% evacuated to inpatient	5% RTD to frontline units No clinical outcomes or long-term data
Peterson, Baker, and McCarthy (2008)	No data Contingency Aeromedical Staging Facility (CASF) at Balad Air Base, Iraq Deployment	<i>N</i> = 262	52% depressive disorders; 23% anxiety disorders; 5% personality disorders; 20% other	No data	No data	No data	No data	No data	No data

Table 4 (continued)

Study	Sample of medical evacuations	Number of (%) psychiatric evacuations	Primary psychiatric diagnosis	Number (%) receiving frontline COSC/BH	Number (%) of relapse after initial RTD	Number (%) with known psychiatric diagnosis before deployment	Number (%) on >1 deployment	Number (%) receiving definitive MH treatment after evacuation	Administrative disposition (e.g., RTD, retention in military, or military discharge)
	2004 and 2006		In 2004, only 7% classified as moderately to severely ill (cat. 1B); 88% categorized as moderately ill (category 1C) In 2006, 50% classified as moderately to severely ill patients (1B); 39% as moderately ill (1C)						
Cohen et al. (2010)	<i>N</i> = 34,046 US military medically evacuated out of OEF/OIF January 2004–December 2007	<i>n</i> = 3108 (9%)	Traumatic brain injury (TBI; <i>n</i> = 218) Substance abuse (SA; <i>n</i> = 98) Stress reactions ( <i>n</i> = 803) Depression or bipolar disorder ( <i>n</i> = 1045) Other ( <i>n</i> = 814)	No data	No data	No data	No data	No data	RTD <i>N</i> = 271 TBI <i>n</i> = 31 (14%) SA <i>n</i> = 13 (13%) Stress reaction <i>n</i> = 72 (9%) Depression or bipolar <i>n</i> = 67 (6%) Other <i>n</i> = 88 (11%) No clinical outcomes or long-term data
Hauret, Taylor, Clemmons, Block, and Jones (2010)	<i>N</i> = 31,728 US military evacuated out of Iraq and Afghanistan 2001–2006	(7%)	<i>n</i> = 68 TBI No other psychiatric diagnoses reported	No data	No data	No data	No data	No data	No data

comparisons between personnel RTD versus evacuation found no significant differences in the primary clinical outcome measured (PTSD rates; Solomon, Weisenberg, Schwarzwald, et al., 1987; Solomon et al., 2005). In fact, the dominant statistical finding is that experiencing CSR by itself is a far greater predictor of subsequent harm irrespective of treatment setting (e.g., Solomon, Weisenberg, Schwarzwald, et al., 1987; Solomon et al., 2005).

Nevertheless, caution in interpreting the IDF's findings is warranted especially with regard to comparing outcomes of evacuated veterans. For example, the military's stated purpose of psychiatric triage is to determine whether combatants can safely be retained in war zones with an expectancy of eventual RTD (e.g., DOA, 2006). If combatants are exhibiting signs of severe CSR and impairment, they will most likely be evacuated per military policy (e.g., DOA, 2006). Logically speaking, it is most likely that the groups of evacuated veterans in the three IDF studies generally represent more severe cases than those RTD. Although the relationship of CSR severity and PTSD was not evaluated in the aforementioned IDF studies, subsequent investigations report significant association (e.g., Solomon, Benbenishti, & Mikulincer, 1988). Moreover, the nature and quality of hospitalized psychiatric treatment IDF evacuees received is highly questionable since some hospitals were general or civilian in nature and not specialized in treating war stress injury (e.g., Solomon & Benbenishti, 1986). Considering these factors alone, IDF reports of essentially equivalent treatment outcomes for evacuee and RTD groups (e.g., Solomon, Weisenberg, Schwarzwald, et al., 1987; Solomon et al., 2005) remain essentially unsupported and not indicative of the claimed value of frontline psychiatry's health benefits.

### Needed Replication of the IDF Studies in the Twenty-First Century

The PIE/BICEPS principles of modern-day frontline psychiatry are relatively unchanged from WWI or WWII (e.g., Russell & Figley, 2016). Today, the US military expects 95% RTD from its frontline psychiatric policies (see Russell & Figley, 2016). Therefore, we should reasonably not expect significant differences in positive clinical outcomes for veterans RTD, consistent with the research on the IDF (e.g., Solomon et al., 2005). However, if twenty-first century veterans will be evacuated to specialized centers delivering high-quality, evidence-based treatments (e.g., Department of Veterans Affairs & Department of Defense, 2010) as opposed to the intervention technology of 1982, we should reasonably expect to see notable improvements from the IDF's baseline outcome data on evacuees, which may even eclipse that of frontline psychiatry. Better controlled research is direly needed on these types of questions.

### Partial Evidence of Frontline Psychiatry's Health Benefits

The past century of frontline psychiatry has produced a high volume of case studies, retrospective record reviews, field reports, and medical bulletins that offer a partial, albeit incomplete assessment of its central tenets. Usually, the focus in the material is on one aspect or another (e.g., measuring outcomes of personnel RTD, but not evacuees, and vice versa). These fractional studies can be divided into five general lines of inquiry: (a) outcomes of deployed personnel with CSR receiving frontline intervention versus veterans without CSR (see Table 6); (b) outcomes of deployed personnel receiving frontline psychiatry only (see Table 7); (c) outcomes of deployed personnel receiving a supplemental component of frontline psychiatry, such as resilience training (see Table 8); (d) outcomes of deployed personnel receiving BH treatment for psychiatric conditions in addition to PIE/BICEP interventions (see Table 8); and (e) outcomes of only deployed personnel evacuated and treated outside war zones (see Table 9). The tables provide only a sampling of a vast literature. Importantly, all the studies reviewed, whether included or not included in the tables, share major methodological limitations that prohibit their utility in answering basic questions: "Do deployed personnel RTD via frontline psychiatry enjoy better long-term outcomes than those evacuated?" In short, they critically omit necessary comparison groups and rarely provide long-term outcomes. Nevertheless, if the military's claims of individual health benefit are generally accurate, we would expect positive trends across most if not all five lines of investigation. In the following, we review the source material for all five areas to ascertain how effective is contemporary frontline psychiatry in the war zone with respect to outcome.

#### 1. Outcome Research on CSR and Frontline Psychiatry

The IDF has taken the clear lead among world military powers in investigating the effects of CSR and frontline psychiatry. The clear majority of IDF studies depicted in Table 6 compare a wide array of long-term outcomes of veterans treated for CSR via frontline psychiatry matched with a control group of veterans not diagnosed with CSR and thus not treated by frontline psychiatry. It bears mentioning that several studies in Table 6 provide unclear descriptions as to whether veterans *referred* to frontline interventions after CSR diagnoses means they received frontline psychiatry (e.g., Solomon & Mikulincer, 1992). Other IDF studies clearly specify that referred CSR groups received frontline psychiatry services (e.g., Solomon et al., 2005). Given the continuity in IDF researchers and methodology, it is reasonable to assume that referral and receipt of frontline psychiatry are one in the same. Per Table 6, outcomes measured by the IDF include risk of immediate and delayed onset of PTSD (e.g., Horesh, Solomon, Zerach, &

**Table 5** Research directly comparing outcomes for deployed IDF personnel RTD versus evacuation

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes	Postdeployment/long-term outcomes	Limitations
Solomon and Benbenishy (1986)	1982 Israeli Lebanon War	N = "several hundred" Israeli soldiers diagnosed and treated for CSR. Sample size unspecified, only percentages reported; divided into four groups: (1) Treated at frontline; (2) treated within border of war zone; (3) evacuated to general hospital in Israel; (4) sought psychiatric help after deployment while on leave	Frontline PIE treatment By groups: (1) = 43% at front (2) = 59% border (3) = 21% evacuated (4) = 28% on leave 151% total unexplained if including relapses	Retrospective 1 year after war assessed for PIE, RTD, and PTSD Proximity: RTD rate; frontline treatment vs. evacuated to rear hospital in Israel Immediacy: queried if treatment received within hours, days, week, or after the war Expectancy: 1 year after ceasefire queried about perceptions of PIE treatment goals (e.g., RTD)	93% No data	Overall, 34% of RTD diagnosed with PTSD 1 year after the war vs. 74% of those evacuated to rear or sought treatment after deployment – Proximity did not significantly reduce PTSD; 52% of RTD after frontline treatment developed PTSD vs. 66% evacuated to rear – 59% of RTD after PIE treatment at border developed PTSD vs. 66% evacuated to rear – Immediate treatment significantly reduced PTSD; 54% of 44% soldiers treated immediately developed PTSD; 73% of 26% soldiers treated within 1 day; 56% of 29% treated within 2 or more days; and 74% of 24% after the war Expectancy did not significantly reduce PTSD, but lowered rates: 55% of 53% soldiers RTD at all cost developed PTSD; 62% of 40% RTD if capable; and 67% of 23% not-RTD – Trend of cumulative benefit of PIE reported, but not statistically significant: Number of PIE principles / RTD% / PTSD% 0 / 22 / 71 1 / 23 / 64 2 / 48 / 59 3 / 60 / 40	No statistical data except % Small sample size Lack randomization and control group Severity of CSR not measured Sampling bias of possible more severe CSR in evacuated group Retrospective study with self-report and recall bias Informal, unsystematic assessment of PIE principles No data on relapse Measurement error (e.g., all reported% total > 100) No information on treatment by a general, nonmilitary hospital
Solomon, Weisenberg, Schwarzwald, et al. (1987)	1982 Lebanon War	N = 470 Israeli soldiers with CSR; n = 155 received frontline treatment for CSR; n = 315 soldiers evacuated to rear hospital treatment for CSR, compared to control of n = 334 matched soldiers without CSR	Frontline use of PIE principles; unspecified treatment at rear hospitals	Retrospective assessment 1 year after the war of CSR and PTSD	No data	Overall, 59% (n = 255) of soldiers experiencing CSR developed PTSD 1 year after the war statistically significant compared to control N = 53 (16% of the control group developed PTSD, but none sought treatment Older veterans had higher PTSD rates and marital status was not significant No report of significant difference between CSR group treated at frontline vs. evacuated to rear hospital After 20 years, soldiers diagnosed with CSR and received frontline treatment	Retrospective study Self-report and recall bias No data on hospital treatment Severity of CSR or impairment not assessed
Solomon et al. (2005)	1982 Israeli Lebanon War	N = 79 Israeli soldiers who received frontline treatment	Frontline PIE treatment and unspecified rear hospital treatment	20-year postwar assessment of mental, physical, and social functioning	No data	After 20 years, soldiers diagnosed with CSR and received frontline treatment	20-year retrospective self-report and recall bias

**Table 5** (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes	Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse	
		for CSR; <i>n</i> = 156 soldiers with CSR evacuated for treatment in rear hospitals; matched with <i>n</i> = 194 soldiers not diagnosed with CSR		IES SCL-90R ULS PTSD-I Problems in Social Functioning Score Subjects asked what PIE principles they received and level of recovery before RTD		had lower rates of PTSD, psychiatric symptoms, and postwar social functioning problems, but not statistically significant Cumulative trend of PIE treatment and PTSD rate reported, but was not statistically significant, revealing 25% PTSD rate when all three PIE principles applied; 32.6% with two principles; 38.5% one principle; and 49.7% no principles No significant group difference in PTSD rate, occupational functioning for CSR casualties treated on frontlines, or evacuated to hospitals No statistically significant outcomes between CSR casualties RTD, and those not RTD 50% more PTSD symptoms in CSR casualties who felt RTD was premature vs. those RTD who felt completely recovered	Unable to substantiate PIE principles applied No measures of CSR severity Quasi-experimental design, lack random assignment; sampling bias. Small sample size in the analysis of long-term effects of frontline treatment in the comparison group ( <i>n</i> = 27), CSR group receiving frontline treatment ( <i>n</i> = 24) as compared to the CSR group receiving rear echelon treatment ( <i>n</i> = 64) Unspecified hospital treatment

Ein-Dor, 2011), multiple somatic complaints (e.g., Ginzburg & Solomon, 2011), harmful drinking (e.g., Solomon & Mikulincer, 1992), global psychiatric distress (e.g., Solomon & Mikulincer, 1988), poor physical health (e.g., Benyamini & Solomon, 2005), as well as postdeployment effects on marital (e.g., Solomon & Mikulincer, 1992), family (e.g., Zerach, Solomon, Horesh, & Ein-Dor, 2013), parenting (e.g., Solomon, Debby-Aharoni, Zerach, & Horesh, 2011), and occupational (e.g., Solomon, Mikulincer, & Kotler, 1987) functioning, along with secondary traumatization of military spouses (Solomon et al., 1992).

The research designs of studies in Table 6 permit a partial assessment of frontline psychiatry's efficacy in preventing adverse health effects. Results from this line of research reveal a universal pattern whereby CSR alone is significantly associated with negative impact on nearly every individual and family-related outcome measure regardless if veterans received frontline psychiatry or not (see Table 6). Furthermore, the cumulative effects of repeated CSR are reported to coincide with progressively poorer clinical outcomes (e.g., Solomon, Mikulincer, & Jakob, 1987; Solomon, Oppenheimer, Elizur, & Waysman, 1990), which has negative implications for the military's mental health policies of repeated RTD until individuals are deemed too impaired or dangerous to remain in war zones (e.g., DOA, 2006).

Solomon et al. (2005) offered the following conclusion from their 20-year longitudinal study on CSR and frontline psychiatry: "Although persons with combat stress reactions may recover, combat stress reaction often crystallizes into chronic PTSD and places casualties at risk for chronic PTSD" (p. 2312) adding that, "As the disease evolves over time, pathological changes and debilitating co-morbidity may become fixed and irreversible" (p. 2312). Importantly, the IDF studies reflect only the outcomes of veterans who remained in war zones after experiencing CSR who may still do better after deployments than their evacuated counterparts. However, it is equally, if not more, likely that the opposite may be the case—especially if the IDF's findings prove replicated that suffering CSR by itself may be sufficient to cause negative health outcomes.

Methodological limitations, such as the absence of randomization, lack of adequate control groups (e.g., no comparison of evacuated veterans with CSR), and inherent potential bias from retrospective reporting (see Table 6), prevent any causal inferences about possible benefits or adverse health effects from frontline psychiatry. It remains possible, however, that a control group of evacuated veterans with CSR may have worse outcomes than those receiving frontline psychiatry (e.g., Martin & Cline, 1996), but this remains conjecture.

## 2. Outcome Research on Personnel Receiving Only Frontline Psychiatry

Table 7 contains several uncontrolled outcome studies narrowly focusing on war-stressed veterans receiving only frontline

intervention. For example, a UK study (Jones, Fear, Jones, Wessely, & Greenberg, 2010) followed 825 British soldiers who received frontline psychiatry/COSC during an Iraq War deployment. Results indicated that 73% of soldiers RTD after frontline intervention remained in the military 2 years following their deployment, but the researchers offered no comparative analysis for soldiers evacuated outside the war zone or those not receiving frontline psychiatry (Jones et al., 2010). Despite the inherent methodological limitations in this study, one can reasonably conclude that most British veterans RTD after breaking down in war zones are not readily discharged by the MoD. It is unclear, however, whether the 73% career retention reflects the effectiveness of frontline psychiatry, per se, or the MoD's mental health policies, or both. For example, fundamental differences between MoD and DoD mental health policies have been reported with regard to deployment length, regulating the amount of war stress exposure, and access to definitive treatment of war stress injury (e.g., Fear et al., 2010). Therefore, it is problematic to generalize UK research on frontline psychiatry to the US military.

US military researchers recently published a single case study on career retention in a deployed soldier diagnosed with acute combat-related PTSD who was RTD after successfully completing a 2-week COSC program in Iraq (e.g., Mattila, Crandall, & Goldman, 2011). The soldier was eventually promoted in rank after returning home from deployment and was pending a second deployment (e.g., Mattila et al., 2011). Therefore, there is emerging evidence that frontline psychiatry does not harm career standing. The absence of an evacuee comparison precludes any further interpretation. In addition, Hoyt et al. (2015) reported that 97% of 513 US soldiers deployed to Afghanistan were RTD after receiving frontline psychiatry with the remainder evacuated. The US researchers also reported postdeployment outcomes for the 4000-member unit, including 365 soldiers seeking mental healthcare shortly after returning home, 19 admitted as psychiatric inpatients, and 158 members referred for BH treatment after screening positive for mental health problems several months later (Hoyt et al., 2015). It is unclear, however, how many soldiers receiving postdeployment BH treatment were of the 513 RTD via frontline psychiatry (Hoyt et al., 2015). No data were provided on the 46 soldiers psychiatrically evacuated out of the war zone, and there was no long-term outcome data reported on those who received frontline psychiatry and BH services (Hoyt et al., 2015). That said, the research constitutes the first US military study that examines frontline psychiatry and postdeployment adjustment.

## 3. Outcomes of Deployed Personnel Receiving Supplemental Frontline Psychiatry Interventions

Table 8 contains various studies on deployed personnel receiving either some type of supplemental or additive frontline psychiatry/COSC intervention (e.g., resilience training). The

nonmilitary RAND research agency investigated the Marine Corps' version of frontline psychiatry/COSC, called Operational Stress Control and Readiness (OSCAR) program (Vaughan et al., 2015). In that study, the health benefits from extensive predeployment OSCAR prevention or resilience training and peer support were examined in a sample of 2523 US Marines deployed to Iraq or Afghanistan who either received the supplemental frontline psychiatry services, or did not. A wide array of psychiatric, social, physical health, behavioral, and work-related outcomes were assessed before and after deployment (Vaughan et al., 2015). The researchers found that the only significant benefit that OSCAR provided was an increase in personal help-seeking (Vaughan et al., 2015). More importantly, the researchers expressed surprise that many clinical outcomes from the OSCAR group were generally worse than for Marines who did not receive the extra prevention intervention, including showing higher rates of PTSD, depression, and poor physical health (Vaughan et al., 2015).

In contrast, UK researchers compared the outcomes of 180 British soldiers from deployed units receiving frontline peer support training and implementation via a peer-mentored trauma risk management (TRiM) program and units that did not receive TRiM training (Frappell-Cooke, Gulina, Green, Hacker Hughes, & Greenberg, 2010). Results indicated significantly reduced scores of psychological distress and anxiety reported after deployment from units receiving TRiM, but long-term outcomes were not assessed (Frappell-Cooke et al., 2010). The major limitations of this line of research are the absence of suitable controls or comparison groups, as well as a lack of long-term outcomes. Thus, the mixed nature of the findings strongly raises the need for a better evidence-base underlying frontline psychiatry's claims of individual health benefits (e.g., Vaughan et al., 2015).

#### 4. Outcome Research on Behavioral Health Treatment in War Zones

Provision of BH in war zones falls within the frontline psychiatry/COSC mission, with the identical expectation of maximizing RTD and reducing evacuation (see Russell & Figley, 2016). Referrals for BH treatment include treatment for both severe CSR/COSR conditions evolving into psychiatric diagnosis like PTSD, as well as noncombat-related psychiatric disorders (e.g., adjustment disorder due to marital strain). Table 8 contains BH treatment outcome studies beyond mere application of PIE/BICEPS frontline principles provided within war zones and to psychiatric evacuees receiving BH treatment outside of war zones. Such an analysis is critical in evaluating the accuracy of military claims that research has demonstrated that RTD is clinically beneficial for service members versus evacuation. As reflected in Table 8, research on BH treatments in war zones consists primarily of case studies or retrospective record reviews. For instance,

three deployed US Marines diagnosed with acute PTSD in Iraq were successfully treated with brief exposure therapy, resulting in 100% RTD and 53% PTSD symptom reduction (Cigrang, Peterson, & Schobitz, 2005). The authors reported that the Marines returned home with their units, but they provided no postdeployment or long-term outcomes (Cigrang et al., 2005). In another US study, 10 deployed personnel were evacuated to a combat stress clinic within Iraq, at which 6 received virtual reality therapy and 4 exposure therapy (e.g., McLay, McBrien, Wiederhold, & Wiederhold, 2010). A PTSD symptom reduction of 67% across both treatment groups was reported, along with no significant outcome differences between treatment groups, resulting in a 100% RTD rate (McLay et al., 2010). No data on relapse or postdeployment adjustment was provided. Similarly, Moore and Krakow (2007) reported a 100% RTD rate of 11 deployed US personnel after receiving frontline psychiatry and BH treatment (imagery rehearsal) for traumatic nightmares that resulted in 64% symptom reduction. Additional treatment studies include Stoller, Greul, Cimini, Fowler, and Koomar (2012), who randomly assigned 80 US soldiers deployed to Iraq to yoga or control groups. They reported significantly lower scores of anxiety and other symptom measures 1 week after training, as well as Parrish (2008) reporting that 99% of 5000 US personnel deployed to Iraq were RTD after receiving both PIE/BICEPS and BH treatment, as well as the finding of only 5 personnel evacuated for psychiatric treatment outside the war zone.

Other war zone clinical research consists of large retrospective record reviews (see Table 8). For instance, Hung (2008) conducted a retrospective analysis of medical records for 49,670 US personnel who received frontline psychiatry during their Iraq deployment, including 8262 who also received BH treatment for a psychiatric condition. Hung (2008) reported that 99% of psychiatric casualties were RTD and only 355, or 0.67%, evacuated outside the war zone. In addition, Schmitz et al. (2012) reported that 99% of 1167 deployed US personnel were RTD after BH treatment for a psychiatric disorder and only 4% were evacuated outside war zones. Unlike the above case studies, the analysis of medical records does not include clinical outcome data, such as symptom improvement. However, it is certainly implied that RTD coincides with symptom resolution, with evacuation reserved for treatment-resistant cases. Therefore, on the face of it, the BH treatment findings appear quite impressive when significant symptom reduction is paired with reports of 99 to 100% RTD. However, none of the studies reviewed include relapse data. Also, critical questions about the long-term health effects of repeated exposure to war stress after CSR/COSR and/or having a psychiatric condition are ignored. Consequently, the only firm conclusion that can be reached in this line of inquiry is that the overwhelming majority (i.e., 97% to 100%) of service members diagnosed and treated for psychiatric conditions

**Table 6** Outcome research on CSR and frontline psychiatry

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Solomon, Mikulincer, and Hobfoll (1986)	1982 Israeli Lebanon War	N = 382 Israeli soldiers who received frontline treatment for CSR; n = 334 soldiers matched from the same unit not diagnosed with CSR	Frontline PIE treatment	1-year postwar assessment of CSR and perception of social support and loneliness MCEI Perception of loneliness Battle intensity	No data	No data	Lack of social support from officers related to greater feelings of loneliness and greater likelihood of CSR in soldiers Lack of social support from buddies associated with greater loneliness Intensity of battle was also related to greater feelings of loneliness and increased likelihood of CSR	Retrospective; self-report and recall bias No data on frontline treatment for CSR Unclear if the CSR group was RTD after PIE, vs. evacuated or discharged Severity of CSR not assessed
Solomon, Oppenheimer, and Noy (1986)	1973 Yom Kippur War and 1982 Lebanon War	Several hundreds of Israeli soldiers diagnosed with CSR during 1973 war; matched with the same number of soldiers after the 1973 war Raw data not provided	No information if the CSR group received frontline or other treatment	9-year postwar assessment of military retention and relapse Review of military health record profile ratings	No data	1%	94% of Yom Kippur veterans diagnosed with CSR were rated as combat ready before the 1973 war, but only 42% were rated combat ready before the 1982 war –6% of these veterans were discharged from military; 47% reassigned to noncombat roles 1% relapse rate for CSR during the 1982 war	Retrospective study Exclusive reliance on percentages and proportions Severity of CSR not assessed No treatment data Lack of objective measures
Solomon and Mikulincer (1988)	1982 Israeli Lebanon War	N = 382 Israeli soldiers who received frontline treatment for CSR; n = 334 matched soldiers from the same unit not diagnosed with CSR; control of n = 88 soldiers who did not deploy	Frontline PIE treatment	1-year postwar assessment of PTSD and social adjustment PTSD-I Problems social functioning scale Premilitary social adjustment Battle intensity	No data	No data	Combat exposure by itself did not account for poor social functioning 1-year after the war Being diagnosed with both CSR and PTSD alone is significantly related to poor postwar social functioning CSR alone is not significantly related to postwar social problems	Retrospective study; self-report and recall bias Intensity of CSR not assessed No precombat assessment of social adjustment
Solomon, Mikulincer, and Jakob (1987)	1982 Israeli Lebanon War	N = 382 Israeli soldiers diagnosed with CSR at frontline; n = 384 matched soldiers from the same unit not diagnosed with CSR	CSR group was referred for psychiatric intervention but no information if treated and treatment setting (frontline vs. evacuated)	1-year postwar assessment of CSR and battle intensity Self-report questionnaire. Each Israeli soldier was asked if he (1) participated in	No data	No data	Soldiers with previous CSR episode were significantly more likely to have another CSR episode regardless of perceived battle intensity. Under high battle intensity, soldiers without prior CSR episode were significantly less	1-year retrospective study No assessment of long-term outcome of repeated CSR episodes Unclear if the CSR group was RTD after PIE, vs.

**Table 6** (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Solomon, Mikulincer and Kotler (1987)	1982 Lebanon War	N = 483 Israeli soldiers; n = 285 diagnosed with CSR at frontline and referred for psychiatric treatment; n = 198 soldiers from the same unit not diagnosed with CSR	CSR group referred for treatment, but no information if received frontline PIE or evacuated	combat and (2) had diagnosis of CSR Battle intensity rating 2-year postwar assessment of CSR and somatic symptoms Health status PTSD-I	No data	No data	likely to have CSR episode in the current battle High battle intensity was significantly related to CSR in both groups CSR group reported significantly more work absences, alcohol use, cigarette use, new medications, new onset chest pain, and digestive problems CSR group reported significantly greater number of somatic complaints vs. control CSR and PTSD independently and combined predicated greater somatic complaints	evacuated or discharged Self-report and recall bias Retrospective study Self-report and recall bias Unclear if the CSR group received frontline treatment No precombat measure of somatic complaints
Mikulincer, Solomon, and Benbenishty (1988)	1982 Lebanon War	N = 104 Israeli soldiers: diagnosed with CSR at frontline and referred for psychiatric treatment; all subjects were discharged from active duty after the war and now in reserves	Frontline PIE treatment	1-year postwar assessment of CSR symptoms and battle (CE) events Interviews coded PTSD-I SCL-90R SEP	100%	No data	17 psychological and somatic symptoms of CSR reported by 10% of sample Total PTSD symptoms correlated with anxiety during combat CSR not significantly related to problems in social functioning CSR significantly associated with PTSD and psychiatric symptoms 1-year postwar Veterans with CSR are often preoccupied with their breakdowns contribute to postwar adjustment problems	Retrospective study Self-report and recall bias No precombat assessment of outcome measures Severity of CSR not assessed
Solomon, Benbenishty, et al. (1988)	1982 Lebanon War	N = 104 Israeli soldiers diagnosed with CSR at the frontline and referred for psychiatric treatment	No information on CSR group receiving frontline treatment or evacuated	1-year postwar assessment of PTSD Premilitary and postmilitary adjustment, combat experiences, and the extent of the CSR episode	No data	No data	Extent of CSR episode and specific combat experiences predicts PTSD Psychological symptoms were predicted mainly by combat experiences, and postwar functioning was predicted mainly by prewar factors Implication of combat experiences and soldiers' immediate reactions during combat in the genesis of subsequent PTSD	Retrospective study Self-report and recall bias Small sample size

Table 6 (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Solomon and Flum (1988)	1982 Israeli Lebanon War	<i>N</i> = 716 Israeli soldiers: CSR group ( <i>n</i> = 382) diagnosed and treated for CSR at frontline; compared to <i>n</i> = 334 non-CSR group	Frontline PIE treatment	1-year postwar assessment of prewar life events and CSR PTSD-I Pre-war Life Events Survey	No data	No data	No significant relation between CSR and positive and negative life events before the war CSR significantly related to PTSD diagnosis PTSD severity correlated with number of negative life events PTSD significantly related to impaired social ties	Retrospective study Self-report and recall bias No precombat measure of PTSD Severity of CSR not measured
Solomon and Mikulincer (1988)	1982 Israeli Lebanon War	<i>N</i> = 483 Israeli soldiers: CSR group ( <i>n</i> = 285) diagnosed and treated for CSR at frontline; compared to <i>n</i> = 198 non-CSR group	CSR group referred for psychiatric intervention at frontline, but no information if treatment was received	1- and 2-year postwar assessment of CSR and PTSD IES PTSD-I	No data	No data	CSR was significantly related to intrusive, avoidance, and other PTSD symptoms at both 1 and 2 years Total distress higher for the CSR group across each time period Both groups reported significantly lower avoidant and intrusive symptoms at the 2nd year	Retrospective study Self-report and recall bias Unclear if the CSR group received frontline treatment No precombat measure of PTSD No data treatment for the CSR group
Solomon and Mikulincer (1988)	1982 Israeli Lebanon War	<i>N</i> = 382 Israeli soldiers who received frontline treatment for CSR; <i>n</i> = 334 matched soldiers from combat unit not diagnosed with CSR	Frontline PIE treatment	1- and 2-year postwar assessment of PTSD symptoms IES PTSD-I	No data	No data	After 1 year: 59% of the CSR group diagnosed with PTSD; 15% control diagnosed with PTSD After 2 years: 56% CSR group and 14% control diagnosed with PTSD CSR associated with intrusion and avoidance symptoms Intrusion symptoms decline more than avoidance symptoms overtime	Retrospective study Self-report and recall bias No precombat measure of PTSD Severity of CSR not assessed
Solomon, Mikulincer, and Bleich (1988)	1982 Israeli Lebanon War	<i>N</i> = 382 Israeli soldiers diagnosed with CSR at the frontlines; <i>n</i> = 334 matched control frontline soldiers not diagnosed with CSR	Diagnosed at frontline but no report if treated at frontline or evacuated	1-year postwar assessment via PTSD-I SCL-90	No data	No data	CSR group significantly more likely to develop PTSD ( <i>n</i> = 228) of the CSR group diagnosed with PTSD; compared to <i>n</i> = 50 of the non-CSR group CSR group significantly higher clinical severity on all three global symptom measures PTSD diagnosis significantly associated with anxiety, depression, hostility, and	No treatment data Retrospective study Self-report and recall bias Severity of CSR not assessed

**Table 6** (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Solomon et al. (1990)	1973 Yom Kippur War and 1982 Lebanon War	N = 24 Israeli soldiers who received frontline treatment for CSR in both 1973 and 1982 wars; n = 39 matched soldiers from the same unit with first time CSR in 1982 war only	Frontline PIE treatment	3-year post-Lebanon War assessed effects of repeat CSR PTSD-I IES SCL-90-R SFP Health status interview PSE	No data	No data	obsessive-compulsive symptoms The repeat CSR group reported significantly more severe pathology and a lower level of social functioning than the first time CSR group CSR group adjustment and symptomatology were significantly worse following the second war than after the first Successful adjustment after the 1st CSR episode did not inoculate against subsequent CSR episodes	Retrospective study Self-report and recall bias Small sample size No precombat data on outcome measures
Solomon, Benbenisht-i, and Mikulincer (1991)	1982 Israeli Lebanon War	N = 65 Israeli soldiers diagnosed with CSR at frontline and referred for psychiatric intervention but remained in the military; compared to matched control group of unknown number of veterans without CSR	No information on CSR group receiving frontline treatment or evacuated	1-, 2-, and 3-year postwar assessment of self-efficacy Combat-related perceived self-efficacy rating PTSD-I SCL-90R Military record of premilitary adjustment	No data	No data	Self-efficacy of the CSR group significantly lower than the non-CSR control group Psychic numbing and loss of control during combat was correlated with lower combat-related self-efficacy 1 and 2 years after the war, but not at year 3 CSR and PTSD severity associated with lower self-efficacy Higher premilitary adjustment rating resulted in higher self-efficacy scores across time	Retrospective study Self-report and recall bias Small sample size No report of treatment for the CSR group No information on control group measure of self-efficacy
Solomon, Mikulincer, et al. (1991)	1982 Israeli Lebanon War	N = 71 Israeli soldiers identified with delayed PTSD the war ended, without prior CSR during the war; compared to n = 73 soldiers diagnosed with CSR and immediate onset	Frontline PIE treatment likely but not certain for immediate onset PTSD group	20-year postwar assessment of social support and coping resources on PTSD onset MCEI WCC PSQ CAQ	No data	No data	Findings indicated that both immediate and delayed PTSD casualties reported higher levels of battle stress than control subjects Delayed PTSD casualties evinced less personal resources than the control group and immediate PTSD casualties evinced still less	Retrospective study Self-report and recall bias Unclear if the CSR group received frontline treatment No precombat measure of coping resources and attributional style

Table 6 (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
		PTSD; matched with $n = 73$ control group of veterans without CSR or PTSD diagnosis 2 years after the war					personal resources than delayed PTSD casualties Delayed onset used more problem-focused coping than immediate onset Both immediate and delayed onset PTSD reported lower officer support PTSD cases attributed causes to more stable and unpredictable factors than non-PTSD	
Solomon and Mikulincer (1992)	1982 Lebanon War	$N = 213$ Israeli soldiers diagnosed with CSR and referred for psychiatric treatment; $n = 116$ matched soldiers from combat unit not diagnosed with CSR	CSR group referred for treatment, but no information if received frontline PIE or evacuated	1-, 2-, and 3-year postwar assessment of CSR PTSD-I IES SCL-90R SFP Health status Perceived self-efficacy	No data	No data	CSR group reported significantly greater PTSD and psychiatric symptomatology across time than controls Psychiatric symptomatology was stable across time in the CSR group, but not PTSD symptoms CSR group reported greater work absences, smoking, drinking, new onset chest, and back pain, as well as digestive problems CSR is significantly related to PTSD CSR group reported significantly more problems in social, marital, work, sexual, and family functioning CSR and PTSD were both independently and cumulatively associated with significant increase in wife's psychiatric symptoms CSR significantly related to PTSD Current husband PTSD significantly contributes to wife's impaired social functioning, feelings of loneliness, adverse marital and family function	Retrospective study Self-report and recall bias No precombat assessment of outcome measures Severity of CSR not assessed
Solomon, Waysman, Levy, et al. (1992)	1982 Israeli Lebanon War	$N = 120$ wives of Israeli soldiers diagnosed with CSR; $n = 85$ wives of soldiers not diagnosed with CSR	Uncertain if the CSR group received frontline or other treatment Secondary trauma was assessed	Wife's perceptions of husband's PTSD Wife's SCL-90-R FES SCQ DAS ULS SSQ	No data	No data	Retrospective study Self-report and recall bias No precombat data on outcome measures Severity of CSR not measured	

**Table 6** (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Dekel et al. (2003)	1973 Yom Kippur War	N = 98, decorated heroes: received medals for bravery in the 1973 Yom Kippur War N = 112 Israeli soldiers who received frontline treatment for CSR; n = 189 matched soldiers not diagnosed with CSR	Frontline PIE treatment	CE PTSD-I SCL-90R	No data	No data	Decorated war heroes reported the highest exposure to battlefield stressors; they functioned better than the other 2 groups during the war. Moreover, some 2 decades later, they showed lower rates of PTSD and better general psychological health than the CSR casualties CSR group had the highest rate of PTSD and psychiatric symptoms vs. decorated veterans and the control group	Retrospective study Self-report and recall bias Severity of CSR not measured Potential demand characteristics of “decorated heroes”
Benyamini and Solomon (2005)	1982 Israeli Lebanon War	N = 286 Israeli soldiers who received frontline treatment for CSR; n = 218 matched soldiers from the same unit not diagnosed with CSR	Frontline PIE treatment	20-year postwar assessment of CSR, PTSD, life stress, and physical health PTSD-I Changes in Health Questionnaire Disease and Symptom Checklist Cumulative Life Stress Checklist	No data	No data	CSR and, to a greater extent, PTSD, were both associated with general self-rated health, chronic diseases and physical symptoms, and greater engagement in risk behaviors CSR and PTSD were related to greater cumulative life stress since the war. Both negative and positive life events were independently related to most of the physical health measures but did not account for the associations of CSR and PTSD with poorer health levels of intrusion and avoidance symptoms and a steeper decline in symptoms over time compared to control CSR alone results in significantly greater levels of somatization symptoms at each subsequent reassessment	Retrospective study Self-report and recall bias No precombat data on outcome measures Severity of CSR not measured
Ginzburg and Solomon (2011)	1982 Israeli Lebanon War	N = 363 Israeli soldiers who received frontline treatment for CSR; n = 301 matched soldiers from the same unit not diagnosed with CSR	Frontline PIE treatment	1, 2, 3, and 20 years postwar assessed for PTSD, childhood trauma, somatic symptoms IES NCLES SCL-90R-somatization subscale	No data	No data	CSR results in higher initial levels of intrusion and avoidance symptoms and a steeper decline in symptoms over time compared to control CSR alone results in significantly greater levels of somatization symptoms at each subsequent reassessment CSR is a marker for future stress reactions and somatization symptoms in both CSR groups, indicating long-term	20-year retrospective study Self-report and recall bias Unclear if the CSR group was RTD after PIE vs. evacuated or discharged Severity of CSR not measured No premilitary measure of PTSD and somatic

Table 6 (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Horesh et al. (2011)	1982 Israeli Lebanon War	N = 369 Israeli soldiers who received frontline treatment for CSR; n = 306 matched soldiers from the same unit not diagnosed with CSR Veterans were divided into 4 groups, according to the time of PTSD onset (e.g., 1983, 1984, 2002, and no PTSD)	Frontline PIE treatment	20-year postwar assessment of immediate and delayed onset of PTSD; combat exposure (CE), PTSD, childhood and postwar life events PTSD-I IES LEQ NCLES CE rating	No data	No data	impact on psychological well-being Number of adverse childhood events did not predict PTSD and somatic symptoms Immediate onset PTSD significantly related to severity of subjective and objective level of CE CSR and CE most predictive across all negative outcomes followed by social support, homecoming exclusion, family conflict and expressiveness CSR was found to be the most powerful predictor of PTSD onset Recency effect was found with more recent life events proving to be stronger predictors of PTSD onset than childhood events Delayed-onset PTSD was found among a substantial number of non-CSR group (16.5%) 60% of the CSR group and 10% controls sought psychotherapy after the war	Retrospective study Self-report and recall bias Unclear if the CSR group was RTD after PIE vs. evacuated or discharged Severity of CSR not assessed No precombat measure of PTSD and social adjustment
Solomon et al. (2011)	1982 Israeli Lebanon War	N = 264 Israeli soldiers who received frontline treatment for CSR; n = 209 matched soldiers from the same unit not diagnosed with CSR	Frontline PIE treatment	20-year postwar assessment of PTSD, marital and parenting problems PTSD-I DAS Parental functioning Life events questionnaire	No data	No data	CSR significantly related to PTSD CSR and PTSD groups independently and cumulatively reported significantly lower marital satisfaction and increased parenting problems than non-CSR and non-PTSD groups Emotional sharing moderated PTSD severity and parenting functioning, but not marital adjustment	Retrospective Self-report and recall bias No precombat measure of marital and parenting functioning Severity of CSR not assessed

Table 6 (continued)

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes		Postdeployment/long-term outcomes	Limitations
					% RTD	% Relapse		
Zerach et al. (2013)	1982 Israeli-Lebanon War	N = 208 Israeli soldiers: CSR group (n = 128) diagnosed and treated for CSR at frontline; compared to n = 80 non-CSR group	Frontline PIE treatment	1-, 3-, and 20-year postwar assessment of CSR and family cohesion IES FES	No data	No data	CSR group had significantly greater avoidance symptoms vs. control Intrusive and avoidance symptoms gradually decreased over time in both groups CSR group reported significantly lower family cohesion at each assessment period CSR group reported significantly greater PTSD symptoms Severity of PTSD symptoms negatively impacted family cohesion, and low family cohesion increased PTSD symptoms	Retrospective study Self-report and recall bias Unclear if the CSR group received frontline treatment No precombat measure of family cohesion and PTSD

*AUDIT-C* Alcohol Use Disorders Identification Test-Consumption, *CAQ* Causal Attribution Questionnaire, *DAS* Dyadic Adjustment Scale, *FES* Family Environment Scale, *DRRI* Deployment Risk and Resiliency Inventory, *HPQ* Health Performance Questionnaire, *IES* Impact of Events Scale, *LEQ* Life Events Questionnaire, *MCEI* Military Company Environment Inventory (social support), *NCLIES* Negative Childhood Life Event Scale, *OQ-45* Outcome Questionnaire-45, *PBQ-SR* Peritraumatic Behavior Questionnaire-Self-Rating, *PCL-M* PTSD Checklist-Military Version, *PHQ-2/8* Patient Health Questionnaire 2 or 8 items, *PIS* PTSD Inventory Scale, *PSE* Perceived Self-Efficacy Scale, *PSQ* Perceived Stress Questionnaire, *ULS* UCLA Loneliness Scale, *SCL-90-R* Symptom Checklist-90-Revised, *SCQ* Somatic Complaints Questionnaire, *SF-12* Short Form Health Survey, *SFP* Problems in Social Functioning Scale, *SSQ* Social Support Questionnaire, *WCC* Ways of Coping Checklist

**Table 7** Outcome research on frontline psychiatry only

Study	War	Sample	Treatment setting	Assessment	Deployment outcomes % RTD Relapse	Postdeployment/long-term outcomes	Limitations
Jones et al. (2007)	WWI	<i>N</i> = 3580 UK soldiers admitted to inpatient NYDN Centre in France	<i>M</i> = 25 days inpatient war zone 4 Stationary Hospital NYDN Centre	<i>M</i> = 11.2 months in war zone before admission 40.3% broke down after 6 months CE 9% 2-year CE old sergeants	35% reassigned in convales-cent 17% RTD <i>n</i> = 606 20% evacuated to base	Of the 606 RTD, 15 (2.5%) were readmitted to 4 Stationary Hospital shortly after discharge <i>n</i> = 93 (2.6%) of the total sample of 3580 soldiers had two hospital admissions	Lack random assignment Only outcome measure is RTD No comparison of RTD vs. evacuation group
Jones et al. (2010)	Iraq War	<i>N</i> = 825 British military personnel deployed to Iraq diagnosed with COSR, who received frontline treatment (Field Mental Health Teams-FMHTs)	Frontline FMHT treatment in Iraq using BICEPS	FMHT records review indicating short-term outcome of RTD or evacuation during deployment Military record review of long-term outcome if retained vs. discharged from military	71.6% RTD documented short-term military work outcome	73.5% of those RTD had a documented long-term military work outcome evident by retention for greater than 2 years postdeployment Adjusting for potential confounders, a shorter service length and removal from the operational theater were both strongly associated with premature discharge; however, it was not possible to determine the severity of the presenting mental health problem and assess whether this impacted outcome	Retrospective record review Severity of COSR not assessed No comparison of evacuation treatment or soldiers with CSR not treated by FMHT
Mattila et al. (2011)	Iraq	<i>N</i> = 1; single case study, 24-year-old Army Corporal with COSR after combat involving killing of insurgents	2-week COSC fitness program, consultation with unit leaders; sleep medication; coping skills; individual supportive counseling	No data	RTD; completed deployment with unit	1 ½ years follow-up, subject was promoted in rank, re-enlisted and pending 2nd deployment	Single case study No psychometrics No long-term follow-up data on 2nd deployment
Hoyt et al. (2015)	Afghanistan	9 months deployment with 4000 member Army Stryker Brigade Combat Team <i>N</i> = 513 (13%)	COSC/BH embedded with Stryker Brigade combat team	No data	97%—RTD 467 (97%)—BH only 46 (8%) evacuated	719 of 3284 (21%) brigade members screened before returning home as <i>moderate to high risk</i> 364 sought BH care in garrison and 19 admitted psychiatric hospitalizations—no outcome data 158 referred to BH after positive screening on 90–180-day reassessment	No data for personnel receiving COSC/BH during deployment No clinical outcome data

**Table 8** Outcome research on supplemental frontline psychiatry and behavioral health treatment

Study	Sample	Treatment setting	Research design	Assessment	Treatment modality	Deployment outcome (e.g., RTD, clinical changes, relapse, evacuation)	Postdeployment outcomes (PDO)	Limitations
Cigrang et al. (2005)	N = 3 US military with acute PTSD	Frontline BH treatment at Iraq Battalion	Multiple case study	PCL Assessed at first and last session	Brief exposure therapy 4 therapy sessions over a 5-week period	100% RTD PTSD symptoms reduced by an average of 56% Final PCL scores within normal limits	No data	Small sample No control Demand characteristics No follow-up data for deployment or PDO
Moore and Krakow (2007)	11 US soldiers in Iraq with acute traumatic nightmares	COSC/BH team in Iraq	Multiple case study Pre-post and 1 month follow-up assessments	Frequency of nightmares Severity of PTSD symptoms Severity of insomnia	Imagery rehearsal therapy 4-weekly 1-h sessions	100% RTD 64% reported significant reduction in nightmares, insomnia, and PTSD symptoms	No data	Demand characteristics No control No long-term, postdeployment follow-up No standardized measures
Hung (2008)	N = 49,670 US military n = 8,262 received BH treatment for psychiatric diagnosis	COSC/BH teams in Iraq	Retrospective review of disposition via COSC Workload and Activity Reporting System (COSC-WARS) Record in Iraq during the first 6 months of 2008	No data Psychiatric diagnoses: Depression (n = 1389) Anxiety (n = 928) Nicotine problem (n = 1002) ASD/PTSD (n = 720) Substance abuse (n = 192) Other problem (n = 1640)	BICEPS individual BH counseling (unspecified)	Overall, 99% RTD: 90.8% (n = 45,100) RTD without limitations; 4.4% (n = 2185) RTD with limitations; 3.4% (n = 1700) “rest” (sent to a nonmedical support unit, typically farther from the frontlines); 0.91% (n = 450) “refer” to a higher level of medical care in theater Only 0.67% (n = 335) medically evacuated out of theater	No clinical outcomes No data on specific treatment modalities No relapse data No PDO	
Parrish (2008)	Estimated n = 5000 BH contacts by US military Number of clients treated not reported	Intensive outpatient level II medical facility, Wimer Wellness Center in Iraq	Retrospective program description	No data	Dialectical behavior therapy and BICEPS Open-ended biweekly individual therapy Group skills sessions Crisis consultation	99% RTD, only n = 5 No clinical outcome data reported	No data	No treatment data provided No clinical outcomes No symptom measures Unclear number of clients treated and outcome No controls Length of Tour and Days to Mental
	N = 473,964 US soldiers discharged	Unspecified treatment	Analysis of medical records	10% (n = 1948) of the total hospitalizations		Risk analysis of mental disorders—OEF	Iraq (mean = 137) and 112 days for	

Table 8 (continued)

Study	Sample	Treatment setting	Research design	Assessment	Treatment modality	Deployment outcome (e.g., RTD, clinical changes, relapse, evacuation)	Postdeployment outcomes (PDO)	Limitations
Wojcik, Akhtar, and Hassell (2009)	from military treatment facilities	during OIF and OEF deployment	and databases of hospital admissions	(episodes of care) in both campaigns included a diagnosis of a mental disorder, and 6% ( $n = 1225$ ) of the hospitalizations had a principal mental disorder diagnosis	Risk analysis of mental disorders—OIF 1565 soldiers had 1633 hospitalizations in OIF, with a mental disorder diagnosed either as a principal or additional diagnosis. Mental disorders that contributed to the 1633	During OEF, 300 soldiers had a total of 315 admissions with any mental disorder. Gender, race, and grade were significant risk factors (Table VI) associated with those hospitalizations. There were 34% ( $n = 108$ ) mood disorders, 28% ( $n = 89$ ) adjustment disorders, 15% ( $n = 47$ ) substance abuse-related hospitalizations, and 13% ( $n = 40$ ) anxiety disorders. Thirty-five percent of the anxiety disorders were the result of PTSD	those serving in Afghanistan (mean—135)	health admissions The median time to hospitalization with a mental disorder from the start of a tour was 118 days for soldiers serving in
Frappell-Cooke et al. (2010)	180 UK military in Afghanistan with posttrauma reactions Army infantry ( $n = 86$ ) Royal Marine Commandos ( $n = 94$ ) adopted TRiM	Frontline use of TRiM in Afghanistan	Multiple case study Predeployment and postdeployment assessments	General Mental Health Questionnaire PCL	Trauma risk management (TRiM), a peer support system	No data on RTD TRiM-experienced unit (Royal Marines) reported lower levels of psychological distress than the TRiM-naive unit (Coldstream Guards) both pre- and postdeployment Reduced levels of anxiety in both groups within the first week of postdeployment, compared with predeployment Both groups reporting significant levels of distress were less likely to perceive effective social support from unit members	No data	No long-term follow-up No outcome comparison with frontline and evacuated personnel
Lande, Williams, Francis, Gragnani,	$N = 49$ US military deployed to Iraq or Afghanistan $N = 22$ biofeedback	Unspecified forward deployed intensive outpatient	Systematic sampling technique with random assignment first	PCL-M ZSRD Pre and after 3-week treatment	Heart variability biofeedback Twice weekly for 3 weeks in 20-min sessions	RTD and relapse not reported Biofeedback did not produce a measurable improvement. Decrease in	No data	No report of RTD and relapse No POD

Table 8 (continued)

Study	Sample	Treatment setting	Research design	Assessment	Treatment modality	Deployment outcome (e.g., RTD, clinical changes, relapse, evacuation)	Postdeployment outcomes (PDO)	Limitations
and Morin (2010)	<i>N</i> = 17 control treatment as usual (TAU)	trauma recovery program	subject and alternating assignment to TAU or biofeedback			PTSD and depression symptoms from baseline to 3 weeks for both the control and treatment group No significant difference in treatment and control		
McLay et al. (2010)	10 US military personnel deployed in Iraq diagnosed with acute combat PTSD	Combat Stress Clinic, Camp Fallujah Iraq	Multiple case study Informed consent led to assignment to either virtual reality therapy (VRT; <i>n</i> = 6) or traditional exposure therapy (TET; <i>n</i> = 4)	PCL-M Patient Health Questionnaire-9 Beck Anxiety Inventory	VRT (mean 6.5 sessions) TET (mean 9 sessions) Treatment duration 10 days–13-weeks	100% RTD On average, patients in VR therapy experienced a 67% decrease in PTSD symptoms as measured on the PCL-M. In 5 out of 6 patients who no longer met criteria, the mean change was 74%, whereas the one remaining individual experienced only a 32% drop. Statistically, there was a significant effect between pretreatment and posttreatment ( $p < 0.001$ ) but no statistically significant effect of treatment group (VR vs. traditional ET)	No data	No random assignment No control No follow-up data No deployment or postdeployment outcome data
Schmitz et al. (2012)	<i>N</i> = 1136 US military seeking BH treatment in Iraq	Data collected by 19 Navy BH providers serving in Iraq	Archival data analysis	No measures reported Psychiatric diagnoses include anxiety disorder ( <i>n</i> = 184; 31%) PTSD ( <i>n</i> = 152; 11%), adjustment disorder ( <i>n</i> = 360; 27%), mood disorders ( <i>n</i> = 340; 25%), 8% ASD ( <i>n</i> = 111)	Medication Psychotherapy or counseling—unspecified Behavioral modification (practice coping skills, exercise, sleep hygiene)	96% RTD; 4% evacuation ( <i>n</i> = 54) 65% on 1st deployment Medication most commonly prescribed treatment Total number BH visits for each person ranged 1–16, 50% only 1 visit 41% received treatment plan including medication 35% given a plan including psychotherapy or counseling (no specifics) 34% received behavioral modification recommendations	No data	No data on treatment effectiveness in war zone No follow-up data after deployment No outcome comparison of RTD and evacuees

Table 8 (continued)

Study	Sample	Treatment setting	Research design	Assessment	Treatment modality	Deployment outcome (e.g., RTD, clinical changes, relapse, evacuation)	Postdeployment outcomes (PDO)	Limitations
Stoller et al. (2012)	<i>N</i> = 70 US military Iraq; <i>n</i> = 35 received 3-week yoga treatment; <i>n</i> = 35 control group no treatment	Forward Operating Base Warrior, Kirkuk, Iraq	Randomized controlled trial (RCT) to evaluate the effect of sensory--enhanced hatha yoga on combat stress, our primary study objective	Adolescent/Adult Sensory Profile STAI Quality of Life Survey	Sensory-enhanced hatha yoga classes—treatment group attended a minimum of 2 sessions/week and a minimum of 9 sessions for a 3-week period. Each class was 75 min long and taught by the principal investigator	(practice coping skills, exercise, sleep hygiene) 21% ( <i>n</i> = 245) contained no treatment plan Meds only; PTSD 26% meds alone; ASD 9%, anxiety 32%; depression (30%) Sensory-enhanced hatha yoga was effective in reducing state and trait anxiety, despite normal pretest scores Treatment participants showed significantly greater improvement than control participants on 16 of 18 mental health and quality-of-life factors Sensory seeking was negatively correlated with all measures except low registration, which was insignificant	No data Demand characteristics No deployment outcomes No long-term, postdeployment follow-up No independent raters	
Jarrett (2013)	<i>N</i> = 3456 US military completed training feedback survey	98th Combat Stress Control Detachment serving Baghdad	5-question Likert scale on training satisfaction survey	Predeployment Warrior Resiliency Training (WRT) combined with in-theater	Rational Emotive Behavioral Therapy (REBT) classes	Participants reported high mean average in satisfaction overall, including being better able to identify PTG and PTSD; ability to enhance resilience and PTG during and after deployment	No data No deployment or PDO outcomes other than posttraining satisfaction External validity No control No measures other than satisfaction	
Vaughan et al. (2015)	<i>N</i> = 2523 US Marines deployed to Iraq or Afghanistan; <i>n</i> = 1631 Marines from battalions received OSCAR/COSC training to promote resilience, compared to <i>n</i> = 892 Marines	Battalion resilience training before deployment	Nonrandomized design with matched control of unit not receiving OSCAR Assessed pre- and postdeployment after returning home on	Life Events Checklist Combat Experience subscale of DRR1 PBQ-SR Social support Help-seeking Unit support PCL-C PHQ-2/8 AUDIT-C SF-12	OSCAR resilience training and peer support	No data No significant group difference on perception of stress response, unit social support; unit cohesion, perception of leadership Only significant benefit from	No information on deployment outcomes such as utilization of frontline psychiatry, RTD, evacuation No long-term clinical outcomes Sampling bias	

**Table 8** (continued)

Study	Sample	Treatment setting	Research design	Assessment	Treatment modality	Deployment outcome (e.g., RTD, clinical changes, relapse, evacuation)	Postdeployment outcomes (PDO)	Limitations
	from battalions that did not receive OSCAR/COSC resilience training		average of 92 days	HPQ			OSCAR was increased individual help-seeking the OSCAR group reported worse clinical outcomes including higher levels of current stress, PTSD, depression, and somatic complaints—although no level of significance No significant difference between groups on high-risk drinking or occupational impairment	Baseline and deployment differences whereby most of the OSCAR group was infantry and control group primarily support personnel

*AUDIT-C* Alcohol Use Disorders Identification Test-Consumption, *CAQ* Causal Attribution Questionnaire, *DAS* Dyadic Adjustment Scale, *FES* Family Environment Scale, *DRRI* Deployment Risk and Resiliency Inventory, *HPQ* Health Performance Questionnaire, *IES* Impact of Events Scale, *LEQ* Life Events Questionnaire, *MCEI* Military Company Environment Inventory (social support), *NCLES* Negative Childhood Life Event Scale, *OO-45* Outcome Questionnaire-45, *PBQ-SR* Peritraumatic Behavior Questionnaire-Self-Rating, *PCL-M* PTSD Checklist-Military Version, *PHQ-2/8* Patient Health Questionnaire 2 or 8 items, *PIS* PTSD Inventory Scale, *PSE* Perceived Self-Efficacy Scale, *PSQ* Perceived Stress Questionnaire, *ULS* UCLA Loneliness Scale, *SCL-90-R* Symptom Checklist-90-Revised, *SCQ* Somatic Complaints Questionnaire, *SF-12* Short Form Health Survey, *SFP* Problems in Social Functioning Scale, *SSQ* Social Support Questionnaire, *WCC* Ways of Coping Checklist, *ZSRDS* Zung Self-Rating Depression Scale

**Table 9** Outcome research only on deployed personnel evacuated and treated outside war zones

Study	War	Sample	Treatment setting	Treatment	Treatment outcomes	Postdeployment/long-term outcomes	Limitations
Yealland (1918) Reported in Linden et al. (2013)	WWI	$N = 196$ UK soldiers treated during WWI 1915–1919	Queen Square Hospital in London $M = 71$ days	Electric shock ( $n = 108$ ) Isolation ( $n = 12$ ) Physical treatment (massage, baths, heat etc.); $n = 59$ Exercises ( $n = 35$ ) Persuasion ( $n = 2$ )	12% RTD $n = 23$ $N = 88$ "cured" $N = 84$ "improved" $N = 24$ no improvement Home service: $n = 22$ Garrison service: $n = 1$ Discharge, "no further use"; $n = 32$ Already discharged from military service: $n = 21$	No data	No long-term outcome data beyond status in the military
Wilde (1942)	WWII	50 UK soldiers treated for war neuroses at base hospital	Base hospital	Narco-analysis	$N = 33$ RTD Improvement in somatic, sleep, head injury, anxiety symptoms	No data	No follow-up data No comparison of frontline RTD
Brooke (1946)	WWII	500 UK soldiers evacuated for battle exhaustion 53% had 4–6 years military service	Specialty inpatient neuroses center in England	No data on treatment type 2 weeks to 3 months. Median 53 days	Cumulative effects of stress 45% (27/60) relapsed from CSC 18% (11/60) previously treated in neuroses centers 5.6% military discharge 17.6% RTD 76.8% reassignment	No data	Small sample Demand characteristics No control No long-term, postdeployment follow-up No standardized measures
Levav et al. (1979)	1973 Yom Kippur War	$N = 35$ Israeli soldiers with CSR evacuated to rear echelon hospital Authors report control group of $n = 55$ soldiers evacuated and treated for physical injuries, not CSR Note. Numbers reported are estimates based on data presented by the authors	Rear echelon inpatient hospital outside war zone	Military psychiatric grading (e.g., diagnosis, disability level) Sociopsych, grading (e.g., level of education, intelligence, personality style) Assessment at onset of CSR, after hospital treatment during war, and 18 months after war ended	Length of treatment correlated negatively with lower psychiatric grading Up to 1 week of treatment: 35% of the CSR group had lower psychiatric grading (poor outcome) 65% of the CSR group had "no change" in grading No data reported on improved grading After "more" than 1 week (unspecified length): 70% had lower grading 30% had no change At war's end, 1.7% of the CSR group categorized as temporary or permanently unfit for military service. Most likely received military discharge	By end of the war: 55% of the CSR group had lower psychiatric grading than at the onset of hostilities 45% "no change" At 18 month follow-up: 60% of the CSR group had lower psychiatric grading 40% "no change"	No data on control group No comparison of soldiers with CSR who were not evacuated and treated at rear echelon Assessment and outcomes reported are unclear No specific report on RTD or long-term adjustment
Russell (2006)	Iraq	4 US military with combat ASD	Navy field hospital in communication zone during Iraq invasion	Eye movement desensitization and reprocessing (EMDR)	None RTD, all stabilized evacuated to stateside hospital All 4 reported significant pre-post reduction in PTSD and depression symptoms 35% reassigned in convalescent 17% RTD $n = 606$ 20% evacuated to base Of the 606 RTD, 15 (2.5%) were readmitted to Stationary Hospital shortly after discharge $n = 93$ (2.6%) of the total sample of 3580 soldiers had two hospital admissions	No data	No follow-up data No comparison of frontline RTD
Jones et al. (2007)	WWI	$N = 3580$ UK soldiers admitted to inpatient NYDN Centre in France	Stationary Hospital NYDN Centre	No data on type of treatment $M = 11.2$ months in war zone before admission 40.3% broke down after 6-month CE 9% 2-year CE old sergeants		No data	Small sample Lack random assignment Only outcome measure is RTD No comparison of RTD vs. evacuation group

**Table 10** Protective factors for US Army personnel deployed to Iraq or Afghanistan (adapted from J-MHAT, 2013)

Survey question	2005	2007	2009	2010	2012
Unit cohesion					
Unit cohesion rated as medium, high, or very high	52.6	61.0	64.1	71.5	74.1
Morale					
Individual morale rated as medium, high, or very high	68.4	52.5	57.5	49.9	47.0
Unit morale rated as medium, high, or very high	60.5	48.7	44.3	45.3	34.5
Leadership					
Officer leadership rated as medium, high, or very high	41.9	48.8	50.2	54.5	43.9
Enlisted leadership rated as medium, high, or very high	41.9	48.4	46.1	51.5	47.1
Resilience					
The training in managing the stress of deployment and/or combat was adequate	No data	No data	No data	56.4	49.9
Posttraumatic growth					
I feel pride in my accomplishments during this deployment	68.0	52.3	57.0	57.6	52.1
Deployment made me more self-confident	63.3	50.1	41.7	39.7	33.3
I deal with stress better because of this deployment	31.4	22.8	25.7	24.3	25.8

during deployment are RTD, with less than 5% evacuated. In short, the predominant emphasis of clinically oriented studies coming out of war zones serves to confirm the benefit to the military mission by conserving the fighting force, but fails entirely to address the consequential long-term health implications for deployed personnel and their families.

##### 5. Outcome Research on Personnel Evacuated from War Zones

Table 9 reviews outcomes of deployed personnel evacuated and treated outside of war zones (e.g., Levav, Greenfeld, & Baruch, 1979), but none of the material includes comparison with personnel RTD via frontline psychiatry. For instance, Yealland (1918) reported that 172 of 196 (88%) shell-shocked soldiers were favorably treated with electrical shock therapy after being evacuated to a London hospital, including 12% RTD to frontline units and 142, or 72%, of soldiers retained on military service (Linden, Jones, & Lees, 2013). During WWII, Wilde (1942) reported the clinical outcomes of 50 US soldiers evacuated and admitted to a base hospital for battle exhaustion. After receiving narco-analysis, 33 (66%) of soldiers were RTD (Wilde, 1942). Brooke (1946) examined the records of 500 UK soldiers evacuated to London-based specialized hospitals for battle exhaustion during WWII and reported that 18% were RTD and 77% remained on active duty (33% discharged from the military). Levav et al. (1979) reviewed medical records for 35 Israeli soldiers during the 1973 Yom Kippur War evacuated to inpatient hospitals outside the war zone for CSR, matched to 55 veterans evacuated for medical reasons. An 18-month follow-up record review was also conducted. The CSR group had significantly poorer health ratings than their medical counterparts, as well as

longer duration of stay correlating with poorer outcomes (Levav et al., 1979). Specifically, 35% of veterans with CSR had lower psychiatric grading at the time of medical discharge and 65% were rated as unchanged (Levav et al., 1979). The nature and type of psychiatric treatment was not specified and outcome measures consisted only of physician grading. At war's end, 17% of the CSR group were classified as unfit for military service and likely discharged, suggesting that 83% were determined to be fit for duty (Levav et al., 1979).

Table 4 contains contemporary military studies on psychiatric evacuations, and treatment admissions from the UK (e.g., Turner et al., 2005) and the USA (e.g., Cohen et al., 2010) all report RTD as outcome. Historically, since WWI, poor RTD rates following evacuations and hospital admission (see Tables 2, 3, and 4) have routinely been interpreted by the military as evidence of individual harm (see Russell & Figley, 2016). Methodologically, all studies reviewed on evacuees have serious methodological limitations, such as the lack of standardized symptom measures, inadequate or lack of treatment details, the absence of control groups, and the lack of long-term outcomes (see Table 9). In sum, the literature on long-term outcomes of psychiatric evacuees is sparse and methodologically flawed, thus prohibiting any meaningful conclusions. That said, the available outcome data on psychiatric evacuees is mixed with some findings supportive of the military claims (e.g., Levav et al., 1979), with others less so (e.g., Brooke, 1946). Unfortunately, what isn't known in the twenty-first century is how might contemporary psychiatric evacuees fare if they receive high-quality evidence-based therapies (e.g., Department of Veterans Affairs & Department of Defense, 2010) via specialized centers.

**Table 11** Meta-analyses and systematic review of risk factors for combat-related PTSD

Study	Design	Sample	Major findings	Limitations
Kulka et al. (1990)	National Vietnam Veterans Readjustment Study—national probability sampling and interview research: preliminary validation, clinical interviews, and family interviews	$N = 3016$ total interviews; $n = 344$ Vietnam theater vets; $n = 474$ spouse interviews; $n = 96$ Vietnam era vets	Exposure to war stress significantly related to combat PTSD independent of precombat predisposing factors PTSD significantly higher in Vietnam theater vs. era vets Premilitary childhood adversity; depression, substance abuse higher in Vietnam theater vets Dosage effect of level of combat exposure and severity of postwar readjustment problems Readjustment problems significantly related to war stress exposure, PTSD, substance abuse, and service connected disability	Nonrandomization Retrospective analysis Verification of reported combat exposure of theater vets
Brewin et al. (2000)	Meta-analysis of risk factors for PTSD	77 studies on military ( $n = 28$ ) and nonmilitary populations	Trauma severity was strongest risk factor during and after trauma followed by: Lack of social support Posttrauma life stress Weak effects for pretrauma factors All predictors yielded significant effect sizes Peritraumatic dissociation strongest predictor Social support had small to medium effect Weakest predictors were family history, prior trauma, and prior adjustment	Heterogeneity of studies with regard to sampling, design, measurement, statistical analysis, and resulting effects
Ozer et al. (2003)	Meta-analysis of studies on predictors of adult PTSD	68 studies met inclusion criteria, 17 involving military veterans: 7 predictors: prior trauma, prior psychological adjustment, family mental health history, perceived life threat, posttrauma social support, peritraumatic emotional response, and peritraumatic dissociation	2362 Israeli war veterans diagnosed with combat PTSD, matched with 2323 veterans not diagnosed with PTSD	Overreliance on retrospective self-report Self-report and recall bias Lack of prospective studies Variability in defining and measuring variables Level of exposure (combat) was not analyzed
Zohar et al. (2009)	Semipropective study of demographic, premilitary, precombat factors, and military risk factors assessed 2 years prior to military service and after deployment	2362 Israeli war veterans diagnosed with combat PTSD, matched with 2323 veterans not diagnosed with PTSD	Social functioning, motivation, training, pre-military/pre-trauma risk factors all found to be insignificant in predicting PTSD	Ceiling effect from stigma, Ex. “Hidden-PTSD” in control group where 16% eventually diagnosed with PTSD; Combat exposure type, intensity, and duration not assessed
Pietrzak et al. (2009)	Retrospective, nonrandomized mailing of surveys to 1000 veterans	28.5% response ( $N = 272$ ) from US OEF/OIF veterans 1–4 years after military discharge	Resilience scores correlated negatively to PTSD, depression, and psychosocial problems CE correlated negatively with postdeployment social support and positively for PTSD, depression, social problems Resilience-mediated unit support and PTSD and depression Unit support predicted increase postdeployment social support 10.8% diagnosed with new onset PTSD	Sampling bias Report and recall bias from retrospective self-report Limited generalizability due to low response rate Limited assessment of spectrum of war stress injury (e.g., substance abuse)

**Table 11** (continued)

Study	Design	Sample	Major findings	Limitations
Phillips et al. (2010)	Prospective study of demographic, pretrauma risk factors, and deployment risk factors before and after deployment	706 US Marine recruits evaluated before and after deployment and combat stress exposure	Combat exposure type (e.g., threat of death, exposure to violence) was the strongest predictor of PTSD than other deployment, postdeployment, and pretrauma risk factors Level of postdeployment social support reduces risk of PTSD	Sampling bias of self-selected volunteers Use of nonanonymous surveys Low response rate (13%) Ceiling effects from stigma and fears of career reprisal PTSD symptoms not assessed prior to deployment
Elbogen et al. (2012)	Cross-sectional, random sampling for national survey by the Department of Veterans' Affairs	$N = 1388$ (56%) of 3000 OEF/OIF US veterans completed mailed surveys	20% met PTSD criteria and 27% alcohol abuse; 33% report violent act in community; 11% severe violence Increase risk of violence linked to CE, younger age, PTSD, alcohol, criminal arrest Decreased risk of violence linked to older age, level of social support and resilience	Generalizability limited by design Lacking longitudinal assessment of protective factors Target of violence not assessed No reporting level of violence experienced during deployment
Ramchand et al. (2015)	Review of literature 2009 to 2014 on risk factors for combat-related PTSD and other mental health (MH) diagnoses in military personnel deployed to Iraq and Afghanistan. Also analyzed treatment seeking vs. nontreatment seeking	48 US studies on military personnel; 56 studies on US veterans 10 non-US studies on military personnel; 4 studies on non-US veterans	0–48% PTSD rates in nontreatment seeking samples; 2–68% in treatment seeking 4–45% depression rates in deployed samples 4–60% alcohol abuse in deployed samples Combat exposure strongest predictor of all MH problems Multiple deployments increase PTSD Lower social support during and after deployment increase risk in MH problems <50% who reported they need treatment, receive it Combat-PTSD significantly related to poor physical health, suicidal ideation, dying by suicide, depression, substance abuse, aggression, and criminal outcomes	Many studies do not control for combat exposure Significant variation in methodological rigor and measurement Inadequate longitudinal data
Xue et al. (2015)	Meta-analysis of combat PTSD risk factors	32 studies accepted out of 2657 screened; 27 risk factors evaluated	Level of combat exposure greatest risk factor for combat PTSD Psychiatric history, life stress, pretrauma history not significant predictors Inconsistent, but strong finding of postdeployment social support and lower PTSD risk	Heterogeneity of studies with regard to sampling, design, measurement, statistical analysis, and resulting effects Inclusion of observational studies only relying on self-report

**Table 12** Percent agree or strongly agree on war zone stigma and barriers in Afghanistan (adapted from J-MHAT, 2013)

Survey question	2003 Army (MHAT-1). Screened positive for a MH disorder—Iraq (%)	2003 Army (MHAT-1). Not screened positive for MH disorder—Iraq (%)	2013 Army (J-MHAT, 2013). Screened positive for a MH disorder—Afghanistan (%)	2013 Army (J-MHAT, 2013). Not screened positive for MH disorder—Afghanistan (%)	2004 Army Post-Deployment Survey (Hoge et al., 2006). Married Soldiers screened positive for a MH disorder—USA	Soldiers (%)	Spouses (%)
I would be seen as weak	59	29	47	23	77	77	22
It would harm my career (or spouses' career)	Not asked	Not asked	40	17	56	56	21
My unit leadership might treat me differently	58	29	39	22	63 (Hoge et al., 2004)	63 (Hoge et al., 2004)	N/A
My leaders would blame me for the problem	46	14	36	14	51 (Hoge et al., 2004)	51 (Hoge et al., 2004)	N/A
My leaders discourage the use of mental health services	Not asked	Not asked	20	4	8 (Hoge et al., 2004)	8 (Hoge et al., 2004)	N/A
There would be difficulty getting time off work for treatment	46	16	46	17	61	61	43

## Summary of Partial Evidence of Frontline Psychiatry's Health Benefits

Of the partial studies reviewed on frontline psychiatry's health benefits, we found mixed empirical support for the military's claims of mutual benefits. The most positive line of inquiries supportive of frontline psychiatry involves military studies focusing exclusively on reporting deployment-related outcomes (i.e., symptom reduction; RTD) of veterans receiving either frontline psychiatry alone (Table 7) or in conjunction with BH treatment (Table 8). Overwhelmingly, these research lines emphasize RTD as a primary outcome measure and find high RTD rates (96–100%) and low evacuation rates (1–8%). Similarly, it is also routine for military researchers to focus predominantly on immediate short-term clinical (i.e., symptom reduction) and dispositional (e.g., RTD) gains at the almost universal exclusion of long-term outcomes of war zone frontline psychiatry (Tables 2, 3, and 4; Tables 5, 6, 7, 8, and 9). This trend is consistent with the only other review of frontline psychiatry (Jones & Wessely, 2003). Consequently, Jones and Wessely (2003) openly questioned the objectivity and veracity of military research on its frontline programs. Moreover, several classified investigations by UK and US authorities during WWII cited major discrepancies between the reported effectiveness of frontline psychiatry and undisclosed high relapse rates (e.g., Jones & Wessely, 2003).

To the lay public, reports of 95–100% RTD imply that deployed personnel have access to highly effective mental healthcare. However, many of the results from our review suggest the contrary. For example, the only nonmilitary investigation into frontline psychiatry (Vaughan et al., 2015) reported poorer postdeployment outcomes for unit members after receiving frontline psychiatry services (OSCAR) compared to those who did not participate. Although methodological limitations do not permit causal inferences, that independent RAND researchers found adverse outcomes from frontline psychiatry is worrisome. Moreover, extensive research on CSR and frontline psychiatry by the world's leading experts, the IDF (see Table 6), indicates that CSR alone represents a significant risk factor for a host of negative individual and family outcomes regardless if veterans receive frontline psychiatry or not, and repeated CSR results in poorer outcomes (see Table 6). With regard to family outcomes, the only research we could find that examines potential health benefits for family members from frontline psychiatry was conducted by the IDF (e.g., Solomon, Waysman, Levy, et al., 1992; see Table 6). Those studies reveal that CSR in deployed family members is significantly related to developing PTSD and other problematic health conditions (e.g., drinking) that, in turn, is significantly associated with multiple adverse outcomes for spousal health, including secondary traumatization (e.g., Solomon et al., 1992), as well as impaired couple and family functioning irrespective if deployed members were treated via frontline psychiatry or not (e.g., Solomon, Waysman, Levy, et al., 1992).

Lastly, the partial line of research on evacuee outcomes (Table 9) indicates that military claims of significant harm caused by evacuation and psychiatric treatment are empirically supported primarily when RTD is the desired outcome (see Tables 2, 3, and 4). Otherwise, long-term outcome data on psychiatric evacuees are nearly nonexistent. When examined, the overall empirical support for frontline psychiatry along the partial lines of inquiry reviewed is tenuous.

We next examine the indirect evidence that underlies the military's health benefit claims. Specifically, we briefly review the research on protective social factors, stigma, and prevention of war stress injury, like PTSD, that reportedly justifies sustaining the frontline psychiatric doctrine.

### Indirect Evidence of Frontline Psychiatry and Protective Factors

Since its WWI inception, frontline psychiatry's emphasis on preventing psychiatric evacuations has been heralded as the centerpiece for military's humane approach in managing war stress casualties by avoiding harm caused by social disruptions that undermine resilience and mental health (e.g., Martin & Cline, 1996). Yet, no study has ever examined the differential impact of protective factors, such as social support, unit cohesion, leadership, and morale, on military personnel RTD via frontline psychiatry compared to those evacuated for treatment outside war zones (see Tables 2, 3, 4, 5, and 6). As reviewed earlier (Russell & Figley, 2016), the US military's frontline psychiatry/COSC programs involve training leaders and unit members on ways to prevent war stress casualties (e.g., Jones et al., 2012). Table 10 provides a descriptive snapshot of the kinds of protective and resilient factors surveyed in the war zones of Afghanistan and Iraq by the US Army's MHAT survey teams. Although this constitutes valuable information for senior leaders in monitoring troop well-being and the capacity to fight and win wars, it does not represent applicable data for justification of RTD of psychiatric casualties to promote the health and well-being of individual service members.

### Research on Unit Cohesion, Morale, and Leadership in Reducing War Stress Casualties

The US military regularly cites research from WWII demonstrating the significant impact of unit cohesion, morale, and leadership in reducing incidence of CSR/COSR casualties and PTSD, as well as enhancing military performance (e.g., Jones, 1995a; Solomon et al., 2005). A retrospective IDF study after the 1973 Yom Kippur War reported that veterans diagnosed with CSR at the frontlines had lower morale than veterans without CSR (Steiner & Neuman, 1978), and meta-analyses

of military research indicate that cohesion is positively correlated with job satisfaction, retention, sense of well-being, and less disciplinary problems (Oliver, Harman, Hoover, Hayes, & Pandhi, 1999), as well as lower levels of psychological distress (Ahronson & Cameron, 2007). The importance of unit cohesion and social support is illustrated by Stouffer et al. (1949), who described that "The men in my squad were my special friends" (p. 99).

### Protective Factors of Cohesion, Leadership, and Morale in Elite Forces

The military regularly avows that the Special Forces have historically produced the highest levels of cohesion, morale, and leadership, coinciding with the lowest rates of psychiatric casualties among military groups (e.g., Jones, 1995b). Such claims add credence to the health-promoting value from preventing psychiatric evacuations. In addition, IDF researchers reported similarly low PTSD rates in decorated veterans (Dekel, Solomon, Ginzburg, & Neria, 2003), implying that membership to elite status may be a protective variable. However, caution is warranted in overinterpreting the protective benefits of cohesion and the like, especially considering heightened stigma active-duty elite personnel experience in self-disclosing stress symptoms (e.g., Hing, Cabrera, Barstow, & Forsten, 2012). For instance, a recent anonymous survey of US Army Special Operations Forces personnel reveals PTSD rates of 16–20%, nearly doubling the prevalence rate reported by regular Army soldiers and contradicting assertions of "hyper-resilience" (Hing et al., 2012). Similarly, the US Army's summary of the 1982 Lebanon War, "Despite high morale and a good deal of attention given by command to morale and the factors maintaining it, the IDF still suffered relatively high rates of psychiatric casualties during the war in Lebanon" (Belenky et al., 1983, p. 22).

Everything said, there is no dispute that factors such as cohesion, morale, and leadership can be beneficial in supporting the mental health of deployed service members. However, this does not automatically translate to better long-term health outcomes for personnel RTD after experiencing war stress injury and/or diagnosed with psychological disorder in war zones. Researchers often make the distinction between delayed presentation and delayed onset with regard to PTSD, with the former often involving the toleration versus absence of symptoms (e.g., Solomon, Mikulincer, & Waysman, 1991). For instance, IDF researchers found the so-called delayed onset of PTSD in 16.5% of combat veterans after leaving military service who were never diagnosed with CSR on active duty (Horeish et al., 2011). Another IDF study used the term *hidden-PTSD* to account for 16% of combat veterans who refused to self-disclose symptoms largely out of fear of stigma and career reprisal (e.g., Zohar et al., 2009). Several authors attribute significant escalation in

veterans diagnosed with mental health problems after military service to phenomena such as diminished levels of protective social support and decreased fear of career reprisal (e.g., Camp, 2014; Kulka et al., 1990). Therefore, it is reasonable to assume that, at least in some if not many cases, the immediate protective benefit from unit support, cohesion, and leadership even in the military's elite forces may erode after returning deployed personnel relocate to other units, retire, or separate from the military.

### Research on Risk and Protective Factors for Combat-Related PTSD

Table 11 contains etiologic research on risk and protective variables for combat-related PTSD, revealing that the level of perceived social support is reliably the best predictor for resilience and the second strongest risk factor for combat-related PTSD after cumulative exposure to war stress. Importantly, the PTSD protection/risk factor of perceived level of social support typically measures postdeployment social support from spouses, family, friends, and community, as opposed to social support during deployment (e.g., Brewin, Andrews, & Valentine, 2000; Kulka et al., 1990; Ozer, Best, Lipsey, & Weiss, 2003). Unfortunately, no studies have compared the purported social protective variables between groups of veterans RTD via frontline psychiatry versus those evacuated.

### Contemporary Research on Unit Cohesion and Social Support

Research on the protective benefits from unit cohesion and deployment-related social support appears to be mixed. Most empirical findings of predictors for combat PTSD, as reflected in Table 11, report that the level of social support in the postdeployment environment (e.g., family, friends, and community) constitutes the most reliable indicator of resilience (e.g., Brewin et al., 2000; Ozer et al., 2003; Phillips, LeardMann, Gumbs, & Smith, 2010). However, recent military studies from the UK (e.g., Du Preez, Sundin, Wessely, & Fear, 2012) and the USA (e.g., Armistead-Jehle, Johnston, Wade, & Ecklund, 2011; Pietrzak et al., 2009) indicate that high levels of unit cohesion are associated with lower probability of postdeployment mental health diagnoses, including PTSD, with the exception of one US finding that only the deployment variable of high morale was a significant buffer against combat PTSD, not unit cohesion or patriotism (Whitesell & Owens, 2012). Additionally, Han et al. (2014) concluded that postdeployment social support was a stronger buffer against combat PTSD than unit social

support during deployment. Others observed how low levels of perceived social support both during and after deployment are significantly related to mental health problems (e.g., Ramchand, Rudavsky, Grant, Tanielian, & Jayconx, 2015). The relative protective benefit from unit cohesion, morale, leadership, social support, etc. is not in question. The critical matter at hand is the fact that none of the studies in Table 11 compare outcomes of deployed personnel RTD via frontline psychiatry to those evacuated out of war zones. We are left with overgeneralization and inferences that service members RTD fare better in the long term than evacuees because of the protective influence of unit cohesion, morale, and leadership.

### Logical Inconsistencies of Beneficial Claims of RTD and Social Protective Factors

Several logical contradictions exist regarding the military's assertion about the iatrogenic effects of disrupted social ties from psychiatric evacuations, such as (a) the fact that unit membership (social ties) is constantly disrupted via the mobility of military lifestyle, requiring frequent changes in duty stations every 3 to 4 years, thus undercutting the resilience narrative; (b) extensive reliance on individual augmentees (IA) during the current wars in Afghanistan and Iraq, whereby individuals routinely deploy from different organizations and return home separately from their combat buddies without significant differences in mental health outcomes as reported by the MoD (e.g., Sundin et al., 2012) and DoD (e.g., Granado et al. (2012); (c) evacuated personnel are restoring social ties with family, friends, undeployed coworkers, and support staff (e.g., mental health professionals, chaplain, etc.), of which research has demonstrated is the single best predictor of resilience (e.g., Brewin et al., 2000; Phillips et al., 2010); and (d) the overwhelming majority (90 to 95%) of military personnel evacuated out of war zones are due to medical reasons (e.g., Cohen et al., 2010), and they must similarly endure disruptions in hypothesized war zone protective factors, yet there is no comparison in the intensity by which the military restricts medical evacuations.

### Evidence That RTD Prevents Harmful Effects of Stigma, Shame, and Guilt from Evacuation

“Evacuees had to deal with the stigma and shame of evacuation out of the theater. However, if psychological casualties were treated at forward locations with brief supportive therapy and the expectation of return to duty, between 60% and 80% could continue as soldiers” (Ritchie, 2007, p. 12). This is a long-standing and central argument used by the military since WWI to justify its frontline psychiatry policies of RTD and preventing evacuation syndromes (e.g., DOA, 2006).

However, the claim appears to be factually baseless. Evidence supportive of the military's assertion is entirely dependent upon broad generalizations from research related to work performance and PTSD protective factors, like unit cohesion, morale, leadership, and social support reviewed earlier. No research has ever compared the differential experience of mental health stigma, shame, and guilt of deployed personnel RTD and return home with their units versus those evacuated and treated at psychiatric facilities outside war zones. As depicted in Table 4, the clear majority (e.g., 90 to 95%) of personnel evacuated out of war zones are for medical and not psychiatric reasons. Many of those service members may likewise experience stigma, shame, and guilt over being wounded, injured, or sick and leaving their combat buddies behind (e.g., Stouffer et al., 1949). Therefore, stigma, shame, and guilt are not unique to psychiatric evacuees, yet evacuation policies are nowhere as restrictive for nonpsychiatric evacuees, thus reflecting a certain bias. Moreover, attitudes toward combat exposure and stress injury may differ per the perspective of warfighters and nonwar fighters. For example, during WWII, Stouffer et al. (1949) conducted a series of social psychological studies on veterans, including the only study we could find that speaks about the issue of possible shame, guilt, and stigma in psychiatric evacuees. Per Stouffer et al. (1949), "Presumptive evidence of this lies in the indications of guilt feelings among men who were out of combat while their comrades were still fighting" (p. 136). There is a wide array of circumstances responsible for separating veterans from their frontline units, and the experience of shame or guilt is not at all unique to evacuated psychiatric casualties. If, however, psychiatric evacuation invokes some exceptional type or intensity of shame, guilt, and stigma above and beyond that experienced by personnel evacuated for other reasons, the phenomena should be researched.

With regard to stigma associated with psychiatric breakdown and possible evacuation, again we refer to WWII research. In an attitude survey, 1766 infantry soldiers in Italy after 5 months of combat exposure were asked "What do you think should be done to a man who cracks up mentally at the front?" (Stouffer et al., 1949). In response, 86% of combat veterans answered, "he should be given medical treatment," whereas only 3% endorsed either "he should be court martialed" or "he should be made to go right back to combat" (Stouffer et al., 1949). Similarly, Momen, Strychacz, and Virre (2012) recently surveyed 553 US Marines about CSR and found that 70.5% believe CSRs are treatable, 68.2% normal reactions, and 57.4% thought they can be individually managed; however, 46.7% personally feared career repercussion if diagnosed with CSR. Whether such seemingly progressive nonstigmatizing attitudes are conveyed to, or perceived by their peers as such in those who might be psychiatrically evacuated is another matter, but it does raise

questions over the legitimacy of military concerns over harmful stigma caused by violating its RTD policy.

### Contemporary Research on Prevalence of Stigma and Barriers to Care

Table 12 illustrates the prevalence of mental health stigma and barriers to care in the war zones of Iraq and Afghanistan as well in the USA. The general trend is for a slight lessening of stigma and barriers to seeking care in the war zones (e.g., MHAT, 2003; J-MHAT, 2013) and increased stigma back home (e.g., Hoge, Castro, & Eaton, 2006). The US Army credits frontline psychiatry, including embedded mental health specialists in operational units (e.g., Army division, Navy aircraft carriers, Marine OSCAR), as being a main contributor in reducing war zone stigma (e.g., J-MHAT, 2013). The evidence would seem to partially support that position. However, per the Department of the Army (2006), modern-day COSC programs are active throughout the entire deployment cycle and the military has permanently embedded mental health specialists in air wings, army divisions, and air craft carriers for decades (e.g., Russell & Figley, 2016). Reducing stigma and barriers to care is a designated function of today's COSC program (e.g., Department of Navy & U.S. Marine Corps, 2010). Therefore, other factors than the presence of forward deployed mental health services may be responsible for incremental reductions in war zone stigma. Regardless, caution is warranted in overinterpreting the military's frontline psychiatry success in reducing war zone stigma. For example, in 2013, 47% of deployed personnel who screened positive for a mental health disorder, such as PTSD, depression, or anxiety, reported reluctance to seek mental health treatment for fear of being weak (J-MHAT, 2013). Similarly, 40% feared career reprisal, 39% believed their unit leadership would blame them for their mental health condition, 46% reported difficulty getting time off to see a specialist and, perhaps most alarmingly, 20% reported unit leadership actively discouraged seeking mental healthcare (e.g., J-MHAT, 2013).

Per Table 12, oppressive levels of stigma both within and outside of war zones appear to negate the military's claim that frontline psychiatry avoids harmful stigma by preventing psychiatric evacuation. Moreover, the Government Accountability Office (2016) recently reported that significant stigma and organizational barriers to seeking mental healthcare widely persists in the DoD, despite repeated recommendations from six independent investigations. In other words, whenever military personnel develop a war stress injury or mental health problem, they face potential harm from stigma and organizational bias, regardless if RTD or evacuated

from war zones or never deployed. On the other hand, Table 12 also suggests that stigma is slightly greater at home than abroad, so one may technically cite greater stigmata effects for personnel evacuated back home. However, without a comparison of the stigmata effects experienced by nonpsychiatric evacuees and/or deployed personnel RTD who subsequently develop war stress injury (e.g., PTSD), any assertion that frontline psychiatry helps individuals avoid harmful stigma by preventing evacuation is not yet substantiated. The hypothesis is worthy of investigation, and the health benefits for service members require that this happens.

### **Evidence That Frontline Psychiatry Prevents Harm from Career Loss**

Since WWI, psychiatric evacuation to hospitals outside the war zone has been associated with increased risk of military discharge, which in large part led to the military's adoption of frontline psychiatry in the first place (see Russell & Figley, 2016). For example, after scouting the British Army's management of war stress casualties before the USA entered WWI, Salmon (1917) reported that 79% of British soldiers were discharged from the military after being evacuated and admitted to UK general hospitals and insane asylums for conditions like "shell shock." Military personnel discharged early from the military for any reason (physical or mental health) were reported to have higher levels of mental health problems than personnel transitioning at the end of their service contracts (Buckman et al., 2012). Therefore, concerns over potential harm from premature military discharge appear justified.

### **Contemporary Research on Military Hospitalizations and Discharge**

In contemporary US military settings, psychiatric disorder is consistently the leading category of discharge diagnoses for military separation. For example, Hoge et al. (2002) reported that nearly 50% of nondeployed service members hospitalized for a psychiatric disorder received a military discharge within 6 months, compared to only 12% of personnel hospitalized for any of 15 other major illness categories (regardless of age, gender, or length of service). Similarly, a 2005 study reported that 45% of US military personnel whose deployment status was unreported were separated from the military for any reason within 6 months of their psychiatric admission, as compared to 11% of discharges following medical justification (Hoge et al., 2005). In other words, a mental health diagnosis, irrespective if deployment related or not, places service members at risk for early military discharge. Possible explanations for the vastly disproportionate rate of psychiatric and medical discharges include mental health stigma, personality disorder, pre-existing mental

health condition, and/or related behaviors incompatible with military service, such as misconduct, substance abuse, and suicide gestures (e.g., Hoge et al., 2005). Importantly, none of these studies specifically examined the role of psychiatric evacuations and hospital admission from war zones. In fact, there is no research comparing postdeployment military separation rates between service personnel RTD via frontline psychiatry and those evacuated and treated in mental health facilities (see Table 9).

For instance, Hoge, Auchterlonie, and Milliken (2006) found that 20.8% of OEF veterans and 21.4% of OIF veterans were discharged from the military within 1 year after endorsing psychiatric symptoms on a postdeployment health assessment (PDHA) suggestive of conditions like PTSD. It bears mentioning, however, that the subjects in the study all returned home with their deployed units as opposed to obtaining psychiatric evacuation. It is unknown what percentage of discharged OEF/OIF veterans were RTD via frontline psychiatry and what percentage of those who screened negative on PDHA were later diagnosed with a war stress injury or the comparative military separation rates for successful treatment completers. The latter is particularly relevant given reports by the architect of the US military's WWI frontline psychiatry doctrine, who reported that 60% of British soldiers were eventually RTD to their units after receiving proper specialized treatment outside the war zone (Salmon, 1917).

Furthermore, a contemporary US analysis of postdeployment hospitalizations for both medical and mental health reasons found that deployed service members overall had a lower risk of hospitalization when compared with nondeployers (Smith, LeardMann, Smith, Jacobson, & Ryan, 2009). Thus, personnel evacuated out of war zones for psychiatric reasons may engender less risk for hospitalization and possible military discharge than those never deployed. In addition, UK researchers reported that individuals prematurely discharged from the military for psychiatric reasons were significantly less likely to have been deployed (Buckman et al., 2012).

Taken together, there appears to be considerable evidence against the automatic assumption that psychiatric evacuees are inherently at greater risk of harm from losing their military careers than those RTD. The bottom line is that we simply do not know the true state of affairs because the issue has yet to be investigated. In sum, the most accurate conclusion that can be reached is that deployed US personnel with a diagnosable war stress injury are at high risk of military discharge whether they are RTD or evacuated for psychiatric treatment. The reasons behind this apparent outcome might relate to mental health stigma and bias, as well as inadequate access to quality mental health treatment (e.g., Institute of Medicine, 2014a). Therefore, until head-to-head comparisons of deployed personnel RTD and evacuated are conducted, any claim that frontline psychiatry benefits military members and their families by preventing career loss is unsubstantiated.

## Evidence That Frontline Psychiatry and RTD Prevents War Stress Injury like PTSD

One of the military's most frequently cited individual health benefits from frontline psychiatry is that RTD prevents or reduces the risk of long-term harm from developing conditions like PTSD. As mentioned earlier, the direct empirical basis of such claims is essentially comprised of a single longitudinal IDF study from the 1982 Lebanon War, in which lower PTSD rates were reported in Israeli veterans RTD after receiving frontline treatment as compared to veterans evacuated to rear hospitals (e.g., Solomon & Benbenishty, 1986; Solomon et al., 2005). Missing, however, is any information on the nature, quality, and effectiveness of the psychiatric treatment the hospitalized evacuees had received. Furthermore, the IDF findings often did not reach statistical significance, as more than half (52%) of those RTD via frontline psychiatry developed PTSD within a year as compared to 66% of soldiers evacuated to a general, nonmilitary hospital (e.g., Solomon & Benbenishty, 1986; Solomon, Weisenberg, Schwarzwald, et al., 1987). Furthermore, as evident in Table 6, the IDF's extensive outcome research on CSR and frontline psychiatry reveals that CSR is robustly associated with a host of chronic adverse health effects, including PTSD, irrespective of whether combatants receive frontline or hospitalized interventions. For example, Solomon and Benbenishty (1986) reported that 52% of Israeli soldiers diagnosed and treated for CSR via frontline psychiatry developed PTSD.

More recently, two independent reviews of the US military's PTSD prevention programs were conducted by the Institute of Medicine (IOM, 2014b) and RAND (Weinick et al., 2011). They examined frontline psychiatry/COSC Battlemind resilience training, and Comprehensive Soldier Fitness resilience and posttraumatic growth training programs, respectively. Both agencies found little empirical support for the military's prevention programs (IOM, 2014b; Weinick et al., 2011). According to the IOM (2014b), "Assessments of DOD programs conducted by this committee and others show that a majority of DOD resilience, prevention, and reintegration programs are not consistently based on evidence and that programs are evaluated infrequently or inadequately" (p. 166). They concluded that "Finally, the committee found limited ongoing evaluation to inform program areas lacking evidence, and a clear need for longitudinal follow-up assessment to determine the impact of resilience, prevention, and early intervention efforts" (p. 166). Similarly, RAND researchers reported "Programs are evaluated infrequently-fewer than one-third of programs in any branch of service reported having had an outcome evaluation in the past 12 months" (Weinick et al., 2011, p. xvii). The general absence of outcome research and data as reported by the agencies seriously undermines the veracity of military claims that frontline psychiatry

is evidence-informed in terms of reducing risk of PTSD or other war stress injury.

## Evidence That RTD via Frontline Psychiatry Enhances Posttraumatic Growth

Lastly, contemporary frontline psychiatry/COSC policy advertises that the benefits to service members include enhancing PTG (DOA, 2006; see Russell & Figley, 2016). Tedeschi (2011) cited evidence of PTG in various studies of combat veterans from the Vietnam, Yom Kippur, and Persian Gulf Wars. The veterans reported positive life outcomes following traumatic amputation, TBI, severe PTSD, and being a prisoner of war. That PTG is one possible pathway for war veterans is not disputed. The issue, however, is whether frontline psychiatry enhances PTG, as the military purports. To that end, commissioned studies of the military's prevention programs by RAND (Weinick et al., 2011) and IOM (2014b) concluded that there is no evidence of efficacy in prevention programs like the US Army's Comprehensive Soldier Fitness training in facilitating PTG. Moreover, no research has ever been conducted on PTG and RTD via frontline psychiatry (see Tables 2, 3, 4, 5, 6, 7, 8, and 9). Similarly, there has been no research on PTG in psychiatric war zone evacuees. Therefore, any claim that frontline psychiatry promotes PTG is unsubstantiated.

## Conclusions on the Health Benefits to Military Personnel and Their Families

In sum, the first-ever systematic review of the military's 100-year-old mental health doctrine provides evidence that the sole empirically tested benefit of frontline psychiatry involves preventing psychiatric attrition from war zones and thus conserving the fighting force. This research outcome is conducive to the primary mission of the military, i.e., to fight and win wars. With regard to the military's claim that frontline psychiatry is mutually beneficial to deployed personnel and their families, we could find no credible evidence to reliably support any of the advertised health-promoting benefits. In fact, trends were identified that appear to neutralize or even contradict most of the military's claims. There has been no effort to properly investigate the long-term health impact from the military's frontline mental health policies. Instead, the vast bulk of military outcome research has narrowly focused on maximizing RTD and restricting evacuations. Instead of any direct testing of the long-term health consequence from its frontline doctrine, the US military has relied extensively on anecdotal reports and on unsubstantiated narrative. We will examine other trends that filter out of the research in our final evidentiary review of potential harm arising out of the military's frontline psychiatry doctrine.

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### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflicts of interest.

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