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Factors Contributing to PTSD Treatment Dropout in Veterans Returning From the Wars in Iraq and Afghanistan: A Systematic Review

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Although treatment effectiveness among evidence-based psychotherapies (EBPs) for posttraumatic stress disorder (PTSD) has been well established, treatment dropout among veterans continues to be a concern within these treatments. Due to the uniqueness of the Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)/Operation New Dawn (OND) veteran cohort, this article reviewed the literature examining factors contributing to treatment dropout from EBPs for PTSD among OEF/OIF/OND veterans. We conducted a systematic review of the published literature using PsycINFO, PubMed, and PTSDpubs with a restriction on year of publication beginning in 2007, following the first VA national initiative to roll-out EBPs for PTSD, through May 1st, 2020. Articles were retained if treatment dropout for EBPs was examined among OEF/OIF/OND veterans with PTSD, which yielded a total of 26 manuscripts. Common themes associated with treatment dropout were identified, including demographic, psychological, cognitive, practical, and treatment-related factors. Specifically, younger age, concurrent substance use, and practical concerns (e.g., balancing multiple life roles) emerged as factors that consistently contributed to treatment dropout. Other findings were mixed (e.g., pretreatment symptom severity and presence of traumatic brain injury). While factors contributing to dropout are complex and interact uniquely for each veteran, improved understanding of these factors in combination with innovative strategies for treating OEF/OIF/OND veterans utilizing EBPs is needed to enhance treatment engagement, retention, and outcomes. Implications for these factors are discussed.

Public Significance Statement

This article provides a synthesis of factors contributing to treatment dropout from trauma-focused treatments among post-9/11 veterans. Trauma-focused treatments consistently yield high rates of treatment noncompletion, particularly among this cohort of veterans. The current review identified several consistent findings contributing to treatment dropout including: younger age (<35 years old), co-occurring substance use, and multiple life roles. Veterans with these characteristics might benefit from additional efforts at treatment engagement to reduce dropout or may require more innovative approaches to increase treatment engagement.

Keywords: veterans, PTSD, posttraumatic stress disorder, treatment dropout, evidence-based psychotherapy

Veterans returning from the post-9/11 conflicts in Iraq and Afghanistan are at high risk for the development of posttraumatic stress disorder (PTSD). Recent meta-analytic work found an average

PTSD prevalence rate of 23% among veterans within this service era cohort (Fulton et al., 2015). In response to this public health concern, the VA/DoD Clinical Practice Guidelines for the Management of PTSD and Acute Stress Disorder (2017) have identified several evidence-based psychotherapies (EBPs) for the treatment of PTSD: prolonged exposure (PE), cognitive processing therapy (CPT), eye movement desensitization and reprocessing (EMDR), written exposure therapy (WET), narrative exposure therapy (NET), brief eclectic psychotherapy (BEP), and cognitive-behavioral therapy (CBT) for PTSD. Although each of these treatments has demonstrated effectiveness at reducing symptoms of PTSD, PE and CPT have received the most empirical attention and support as being efficacious among veterans (e.g., Eftekhari et al., 2013; Foa et al., 2008; Monson et al., 2006; Steenkamp & Litz, 2013; Steenkamp et al., 2015). Indeed, PE and CPT have outperformed waitlist, treatment-as-usual, and non-trauma-focused treatments among veterans diagnosed with PTSD (for a review, see Steenkamp et al., 2015).

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Despite favorable, empirically supported treatment outcomes, there are several challenges associated with the implementation of trauma-focused EBPs among veteran populations. For example, veterans across service eras often prematurely discontinue treatment prior to receiving the minimum intended number of sessions, with recent estimates of treatment noncompletion (i.e., dropout) ranging between 25 and 48% (Steenkamp et al., 2020). Moreover, higher rates of treatment dropout have been observed in naturalistic, clinical care settings as compared to clinical trials (e.g., Goetter et al., 2015; Hembree et al., 2003; Zayfert et al., 2005), raising questions about the generalizability of these treatments delivered in the context of clinical trial research to real-world clinical practice (i.e., CPT and PE).

The definition of the term “dropout” has varied depending on the nature of the study, which may potentially account for some of the differences in rates of treatment dropout across studies (e.g., Goetter et al., 2015; Imel et al., 2013; Najavits, 2015; Steenkamp & Litz, 2013). For example, some studies define treatment dropout from a clinical perspective, such as when a client discontinues treatment before achieving their agreed-upon PTSD treatment goals (e.g., Davis et al., 2013; Schumm et al., 2017; Zayfert et al., 2005). Other studies define treatment dropout as a function of dosage (i.e., occurring when clients fail to attend a predetermined number of sessions; e.g., Eftekhari et al., 2013; Hundt et al., 2018; Maieritsch et al., 2016). Despite differential operationalization of the term, few studies have identified predictors of treatment dropout, particularly among veterans returning from the wars in Iraq and Afghanistan, a cohort evidencing signs of increased risk for PTSD and treatment dropout.

The Impact of Service Era

While the veteran service era is often discussed within the context of treatment dropout, the extant literature demonstrates that findings are mixed. For example, some research has found higher dropout and lower completion rates among veterans returning from the Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)/Operation New Dawn (OND) missions as compared to non-OEF/OIF/OND veterans (e.g., Chard et al., 2010; Eftekhari et al., 2013; Yoder et al., 2012). Other research has suggested that OEF/OIF/OND veterans have longer episodes of treatment for PTSD (Harpaz-Rotem & Rosenheck, 2011), or that there is no significant association between service era and treatment completion (Brown et al., 2016). Although variability in the literature exists as to whether service era plays a role in the elevated rate of treatment dropout among veterans, there are unique characteristics associated with OEF/OIF/OND veterans that warrant special clinical and research attention related to treatment completion.

Uniqueness of the OEF/OIF/OND Veteran (2001–Present)

In previous service eras, many service members were draftees who typically served for one combat tour and assumed a significant portion of the combat burden. In contrast, during the OEF/OIF/OND era, service members in brigade combat units (Army), regimental combat teams (Marine Corps), and other military infantry units have been volunteers who effectively spent the bulk of their military time rotating in and out of Iraq and/or Afghanistan in multiple

deployments during which they were either in combat or in training to return to combat (Kline et al., 2010; Korb et al., 2009). Thus, many of these veterans had multiple tours of service and deployments, more than veterans of other service eras. As noted in a recent commentary on psychotherapies for military-related PTSD, OEF/OIF/OND veterans have been exposed to extended periods of traumatic circumstances including life-threatening events, morally compromising experiences, and traumatic loss (Steenkamp et al., 2020). Additionally, a larger percentage of OEF/OIF/OND veterans are female veterans (19% vs. 3.5% of Vietnam veterans; National Center for Veterans Analysis and Statistics, 2019), many of whom served in active combat.

OEF/OIF/OND veterans also typically faced a unique set of battleground stressors: urban warfare, a nontraditional enemy, and improvised explosive devices (IEDs; e.g., Chard et al., 2010; Fontana & Rosenheck, 2008). Perhaps unsurprisingly, given the unique combat exposures among this cohort of veterans, OEF/OIF/OND veterans presenting for treatment have been found to exhibit a specific constellation of comorbidities, including greater severity of PTSD symptoms than Vietnam veterans (Brown et al., 2016; Fontana & Rosenheck, 2008), chronic pain (Helmer et al., 2009; Lang et al., 2016; Lew et al., 2009), and postconcussive syndrome (Helmer et al., 2009; Lew et al., 2009). Other common comorbidities observed within this cohort of veterans include substance abuse (Erbes et al., 2009; Helmer et al., 2009; Jakupcak et al., 2010), insomnia (Wallace et al., 2011), and depression (Helmer et al., 2009; Jakupcak et al., 2010). Lastly, OEF/OIF/OND veterans experience an alarming rate of suicide attempts and death by suicide (Ursano et al., 2015). Considered jointly, the combination of deployment-related experiences, and common comorbidities of veterans enlisting in the military post-9/11 highlights the impetus to identify risk factors for treatment dropout specifically among OEF/OIF/OND veterans. As such, this review sought to expand upon the current literature by identifying factors associated with treatment dropout that is specific to the OEF/OIF/OND veteran cohort.

Method

Search Strategy and Study Selection

A comprehensive systematic review of the literature was conducted to identify and select research articles for potential inclusion across three major databases (PubMed, PsycINFO, PTSDpubs [formerly PILOTS]). Studies included in this review consisted of published, English language, peer-reviewed articles focused on factors related to treatment dropout and/or retention among OEF/OIF/OND veterans receiving an EBP for PTSD; dissertation studies were excluded. Relevant articles were those published after January 1, 2007—following the national initiative for the dissemination of EBPs for PTSD in the Department of Veterans’ Affairs (VA; Karlin et al., 2010)—through May 1, 2020. Although not all of the included EBPs were rolled out in VA beginning in 2007, this date was selected to allow us to capture the largest number of relevant publications. To identify relevant publications, we searched databases using the following primary search terms: “posttraumatic stress disorder” and “PTSD,” which were combined with the secondary search term “veterans” to ensure sampling of articles relevant to the population of interest. These were combined with the following tertiary search terms: “cognitive processing therapy,”

“CPT,” “prolonged exposure,” “PE,” “eye movement desensitization and reprocessing,” “EMDR,” “cognitive behavioral therapy for PTSD,” “CBT for PTSD,” “brief eclectic psychotherapy for PTSD,” “BEP for PTSD,” “narrative exposure therapy for PTSD,” “NET for PTSD,” and “written narrative exposure, and “WET for PTSD.” Lastly, these were combined with the quaternary search terms “dropout” and “retention.” We did not operationalize the term “dropout,” and instead referred to each individual study’s definition of the term in order to include the largest number of relevant articles in the current review. Reference sections of included articles were utilized as additional checkpoints to ensure no articles relevant to this review had been overlooked in the database searching. Studies were included if they: (a) reported upon novel empirical findings of one of the aforementioned EBPs for PTSD with (b) analyses examining factors that contributed to treatment dropout or retention among (c) OEF/OIF/OND veterans.

Data Extraction and Quality Assessment of Studies

Two authors (BAB & LJS) extracted relevant data from the full text of all included studies. The primary aim of the current article included a review of factors associated with treatment dropout among OEF/OIF/OND veterans. Therefore, relevant data included the type of veteran sample (e.g., all OEF/OIF/OND vs. mixed era), sample demographics (e.g., age, race, and marital status), EBP type (e.g., PE and CPT) and modality of treatment delivery (e.g., individual therapy and in-person sessions), rate of treatment dropout, factors assessed as contributing to treatment dropout, and study design. Study quality for each included article was assessed using an existing evidence appraisal tool of a single prospective or retrospective study that evaluated etiology, risk factors, and incidence rates (Cincinnati Children’s Hospital Medical Center, 2006–2012), with minor adaptations. This quality assessment tool evaluated study validity (e.g., “At the start of the study, were the participants similar with respect to known factors of interest?”), reliability (e.g., “Did the study have a sufficiently large sample size?”), and applicability (e.g., “Can the results be applied to my population of interest?”). Items were scored as follows: 0 = *no* or 1 = *yes*, with higher scores suggesting greater study quality. Of note, two items were removed and one item was added, resulting in a total of 14 possible points.

Results

In order to best interpret and generalize results, study characteristics and outcomes are summarized in Tables 1 and 2. Specifically, methodological details and information relevant to the veteran sample (e.g., war era, study design, EBP type, and dropout rate) and findings are noted in Table 2.

Search Results

The identification and inclusion of relevant studies are presented in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). To ensure accuracy and reduce coder bias, the screening and coding of all articles were conducted independently by two reviewers (BAB & LJS). Additionally, the first author reviewed articles when it was unclear whether an article met all inclusion

criteria and at the final stage of eligibility for accuracy. The initial review resulted in a total of 707 articles, yielding 176 from PsycINFO, 265 from PubMed, and 266 from PTSDpubs, respectively. Specifically, 126 were identified as unique articles across all three databases. The remaining articles were reviewed and assessed for potential relevance based on title and abstract, which resulted in the elimination of 50 articles on the basis of (a) nonempirical study ($n = 15$); (b) nonhuman sample ($n = 1$); (c) nonveteran sample ($n = 6$); (d) factors related to treatment dropout/retention not examined ($n = 6$); (e) OEF/OIF/OND veterans not included ($n = 2$); (f) study occurred prior to VA EBP roll-out initiative (i.e., prior to January 1, 2007; $n = 1$); (g) non-peer-reviewed article ($n = 1$), and (h) no EBP for PTSD examined ($n = 18$). Full-text publications for the remaining 76 articles were obtained and fully reviewed by both raters. Based on this review, an additional 50 articles were eliminated due to (a) nonveteran sample ($n = 2$); (b) factors related to treatment dropout not empirically examined ($n = 8$); (c) war era for sample not specified ($n = 20$); (d) nonempirical study ($n = 1$); (e) OEF/OIF/OND veteran findings not specified or included ($n = 18$); and (f) no EBP for PTSD examined ($n = 1$). Thus, the final systematic review included a total of 26 publications meeting all inclusion criteria. Of note, none of the studies meeting inclusion criteria provided an evaluation of factors associated with treatment retention; however, several studies propose suggestions for treatment retention based on study findings. As a result, the findings discussed in the results section of this article address factors associated with treatment dropout. Moreover, none of the studies identified in the search evaluated factors associated with treatment dropout in EMDR, WET, NET, or BEP. Consequently, the results of the current review are drawn from the literature on treatment dropout from CPT and PE. See Figure 1 for a synthesis of the review process and Table 1 for detailed characteristics of the included studies.

Study Quality

Quality ratings were conducted independently by the first two authors; there was a 93.7% agreement between the two raters. Discrepancies among ratings were discussed until a consensus was reached. Based on our quality checklist, the modal score for the articles included in this review was 11 (range: 8–13). Of note, all studies accounted for treatment noncompleters (e.g., intent to treat analysis and identifying the percent of dropout) and 69.2% ($n = 18$) identified treatment dropout as a primary variable of interest. Eight studies were RCTs (30.8%), and all others were retrospective, uncontrolled, or naturalistic studies. Table 3 provides the individual study’s scores for each quality assessment item.

Factors Associated With Treatment Dropout

A synthesis of the literature meeting inclusion criteria resulted in the identification of several variables associated with treatment dropout among OEF/OIF/OND veterans, including demographic characteristics, psychological factors, cognitive factors, practical concerns, and therapy-related factors. Below we review each of these factors. Of important note, the literature revealed mixed findings for many of these factors. Considered jointly with the results of the quality assessment, it is possible that some of these conflicting results are related to study design (e.g., naturalistic treatment vs. randomized control trial [RTC]); however, there are

Table 1
Summary of Study Characteristics

Study	Sample Type	Demographics	War Era (s)	Dropout (%)	Completion definition	Completers	Dropouts	Design	EBP Type
Belsher et al. (2015)	OEF/OIF/OND entire sample	24 veterans with PTSD symptoms	100% OEF/OIF/OND	50	>5 sessions (out of 8 total)	12 veterans	12 veterans	Nonrandomized effectiveness study: a cognitive-behavioral web-based intervention for posttraumatic stress; 8 sessions	CBT for PTSD
Capone et al. (2018)	OEF/OIF/OND entire sample	21 veterans with PTSD and a substance use disorder in the ICBT condition [95.2% male; M_{Age} OEF/OIF/OND = 36.48 ± 9.82 years; 86.7% White]	100% OEF/OIF/OND	61.9	≥ 8 sessions	8 veterans	13 veterans	Randomized, repeated measures, pilot trial: ICBT versus treatment as usual; 12 sessions (combination of individual and group therapy)	CBT for PTSD
Chard et al. (2010)	OEF/OIF/OND subsample	101 veterans with PTSD [100% male; M_{Age} OEF/OIF/OND = 30.90 ± 8.5 years; M_{Age} Vietnam = 59.4 ± 3.1 years; 88.0% White]	50.5% OEF/OIF/OND 49.5% Vietnam	30.7	≥ 12 sessions	70 veterans [88.1% male; M_{Age} = 45.9 ± 15.6 years; 91.0% White]	31 veterans [87.5% male; M_{Age} = 42.7 ± 15.7 years; 81.0% White]	Naturalistic treatment study of patients engaged in CPT with a clinician in a VHA PTSD clinic or OEF/OIF clinic; ≥ 12 sessions	CPT
Crocker et al. (2018)	OEF/OIF/OND entire sample	74 veterans with PTSD and history of mild-to-moderate traumatic brain injury [87.8% male; M_{Age} = 34.3 ± 7.9 years; 47.3% White]	100% OEF/OIF/OND	43.2	12 sessions	42 veterans [88.1% male; M_{Age} = 34.9 ± 8.1 years; 47.6% White]	32 veterans [87.5% male; M_{Age} = 33.6 ± 7.8 years; 46.9% White]	Randomized treatment study: CPT-C versus modified CPT with cognitive rehabilitation strategies; 12 weeks	CPT
Davis et al. (2013)	OEF/OIF/OND entire sample	136 veterans with combat-related PTSD who began CPT with ($n = 44$) and without ($n = 92$) a history of mild TBI [87.8% male; M_{Age} = 34.3 ± 7.9 years; 47.3% White]	100% OEF/OIF/OND	43.2	12 sessions or clinician note indicated that treatment had been completed	42 veterans [88.1% male; M_{Age} = 34.9 ± 8.1 years; 47.6% White]	32 veterans [87.5% male; M_{Age} = 33.6 ± 7.8 years; 46.9% White]	Retrospective: VHA chart review	CPT
DeViva (2014)	OEF/OIF/OND entire sample	200 veterans with PTSD [92% male; M_{Age} = 30.2 ± 7.4 ; 65% White]	100% OEF/OIF/OND	43	Documented mutual agreement between therapist and referral	24 veterans [88% male; M_{Age} = 35.1 ± 9.7 years; 63% White]	86 veterans [97% male; M_{Age} = 30.2 ± 6.9 years; 63% White]	Retrospective: VHA chart review of 200 consecutive OEF/OIF referrals to a PTSD specialist for psychotherapy	CPT/PE
Eftekhari et al. (2013)	OEF/OIF/OND subsample	1931 veterans with PTSD [87.1% male; M_{Age} = 46.8 ± 14.3 years]	37.4% OEF/OIF/OND 35.2% Vietnam 8.8% Persian	28.1	≥ 8 sessions	1389 veterans	542 veterans	Naturalistic treatment study of patients engaged in PE with a clinician that	PE

Table 1 (continued)

Study	Sample Type	Demographics	War Era (s)	Dropout (%)	Completion definition	Completers	Dropouts	Design	EBP Type
Ford et al. (2018)	OEF/OIF/OND entire sample	31 veterans with PTSD and severe anger problems [100% male; $M_{Age} = 36.5 \pm 9.8$ years; 84.0% White]	Gulf18.6% Other 100% OEF/OIF/OND	45.2	≥ 8 sessions	17 veterans	14 veterans	participated in a VHA PE training program; 8–15 weeks Randomized treatment study: PE versus Trauma Affect Regulation: Guide for Education and Therapy (TARGET); 10 sessions	PE
Franklin et al. (2017)	OEF/OIF/OND subsample	27 rural veterans with PTSD [92.6% male; $M_{Age} = 46.1 \pm 15.5$ years; 69.2% White]	51.9% OEF/OIF/OND29.6% Vietnam7.4% Operation Desert Storm7.4% None3.7% Other	30.7	≥ 10 sessions	13 veterans [92.3% male; $M_{Age} = 50.0 \pm 16.8$ years; 75.0% White]	14 veterans	Randomized treatment study: PE delivered via iPhone 4, PE delivered via computer-based teleconferencing or TAU; 12 weeks	PE
Fryml et al. (2018)	OEF/OIF/OND entire sample	12 veterans with combat-related PTSD [21–50 years]	100% OEF/OIF/OND	34	Entire active treatment program	8 veterans [87.5% male; 21–50 years]	4 veterans	Randomized treatment study: prospective, double-blinded, active sham-controlled design consisting of standard PE and rTMS sessions; 5 weeks	PE
Garcia et al. (2011)	OEF/OIF/OND entire sample	117 veterans with PTSD and combat exposure seeking treatment in a VHA PTSD specialty clinic [95.7% male; $M_{Age} = 32.4 \pm 7.9$ years; 54.7% Hispanic/Latinx]	100% OEF/OIF/OND	67.5	Leaving treatment prior to reaching predefined treatment goals agreed upon by the clinician and patient	38 veterans	79 veterans	Retrospective: VHA chart review	CT for PTSD/PE
Gros et al. (2018)	OEF/OIF/OND subsample	150 veterans with PTSD [98.1% male; $M_{Age} = 41.4 \pm 14.1$ years; 59.3% White]	63.3% OEF/OIF/OND20.7% Vietnam16.0% Persian Gulf	40.7	≥ 8 sessions	89 veterans	61 veterans	Randomized treatment study: PE delivered in person or via telehealth technology; 5 weeks	PE
Grubbaugh et al. (2016)	OEF/OIF/OND subsample	34 veterans with SMI and PTSD [88.2% male; $M_{Age} = 47.8 \pm 13.4$ years; 55.9% Black]	23.5% OEF/OIF/OND38.2% Vietnam11.8% post-Vietnam 26.5% Persian Gulf	32.4	≥ 5 sessions	23 veterans	11 veterans	Nonrandomized treatment study: open trial of PE; 10–15 sessions	PE

(table continues)

Table 1 (continued)

Study	Sample Type	Demographics	War Era (s)	Dropout (%)	Completion definition	Completers	Dropouts	Design	EBP Type
Hundt et al. (2018)	OEF/OIF/OND subsample	28 veterans who completed 1+ sessions of CPT or PE, but did not complete minimum dose [60.7% male; $M_{Age} = 45.3 \pm 15.2$ years; 61% Black]	25% reported criterion A trauma related to OEF/OIF/OND combat	100	Minimum dose of CPT or PE	N/A	28 veterans [60.7% male; $M_{Age} = 45.3 \pm 15.2$ years; 61% Black]	Qualitative	CPT/PE
Jeffreys et al. (2014)	OEF/OIF/OND subsample	396 veterans with military-related PTSD	Sample consisted of OEF/OIF/OND, Vietnam, and Desert Storm veterans	33.6	$\geq 2/3$ of recommended sessions	263 veterans [97.7% male; $M_{Age} = 51.0 \pm 13.9$ years; 55.9% Hispanic/LatinX]	133 veterans	Retrospective: VHA chart review	CPT/PE
Kehle-Forbes et al. (2016)	OEF/OIF/OND subsample	351 veterans who initiated PE or CPT following an intake at a VHA PTSD clinical team [81.1% male; $M_{Age} = 46.6 \pm 14.6$ years]	43.6% OEF/OIF/OND 20.4% Gulf War 36.1% Vietnam	38.5	A final session note for CPT or PE in VHA chart	216 veterans	135 veterans [38.1% male; $M_{Age} = 42.7 \pm 14.4$ years]	Retrospective: VHA chart review	CPT/PE
Kozel et al. (2018)	OEF/OIF/OND entire sample	103 veterans with combat-related PTSD [predominately male; Age Range = 18–60 years]	100% OEF/OIF/OND	39.8	≥ 12 sessions	62 veterans	41 veterans	Randomized treatment study: CPT and either active or sham rTMS; 12–15 sessions.	CPT
Lamkin et al. (2019) ^a	OEF/OIF/OND entire sample	90 veterans with military-related PTSD [93.3% male; $M_{Age} = 30.9 \pm 6.1$ years; 71.1% White]	100% OEF/OIF/OND	47.8	12 sessions	47 veterans	43 veterans	Randomized treatment study: in-person CPT versus video telehealth CPT; 12 sessions	CPT
Maieritsch et al. (2016)	OEF/OIF/OND entire sample	90 veterans with military-related PTSD [93.3% male; $M_{Age} = 30.9 \pm 6.1$ years; 71.1% White]	100% OEF/OIF/OND	43.3	≥ 10 sessions	51 veterans	39 veterans	Randomized treatment study: in-person CPT versus video telehealth CPT; 12 sessions	CPT
Mott et al. (2014)	OEF/OIF/OND subsample	91 veterans who attended at least one individual outpatient session with a CPT or PE trained provider [91.2% male; $M_{Age} = 50.42 \pm 16.1$ years; 60.9% White]	40.6% OEF/OIF/OND 59.4% Other	38.5	≥ 7 sessions and provider indicated that treatment was completed	58 veterans [94.8% male; $M_{Age} = 55.5 \pm 13.7$ years; 56.4% White]	33 veterans [84.8% male; $M_{Age} = 41.9 \pm 15.9$ years; 68.8% White]	Retrospective: VHA chart review	CPT/PE

Table 1 (continued)

Study	Sample Type	Demographics	War Era (s)	Dropout (%)	Completion definition	Completers	Dropouts	Design	EBP Type
Schumm et al. (2017)	OEF/OIF/OND subsample	798 veterans participated in an EBP for PTSD in an outpatient VHA PTSD specialty clinic [89.3% male; Age Range = 29–60 years; 80.7% White]	39.7% OEF/OIF/OND 60.3% Other	50.3	≥9 sessions or medical record notes documents that the clinician and patient had agreed that treatment was completed	397 veterans	401 veterans	Retrospective; VHA chart review	CBT for PTSD/CPT/PE
Smith et al. (2015)	OEF/OIF/OND subsample	67 veterans with PTSD who were interested in group therapy [98.5% male; $M_{Age} = 54.5 \pm 13.3$ years; 76.1% White]	23.9% OEF/OIF/OND 67.2% Vietnam 8.9% Other	26.9	≥6 group sessions and ≥2 individual sessions	49 veterans [$M_{Age} = 54.7 \pm 13.5$ years; 79.6% White]	18 veterans [$M_{Age} = 54.0 \pm 13.3$ years; 66.7% White]	Nonrandomized treatment study; group and individual hybrid PE; 12 sessions	PE
Szafranski et al. (2014)	OEF/OIF/OND entire sample	282 veterans with PTSD in a VHA inpatient PTSD treatment program [100% male; $M_{Age} = 29.7 \pm 5.2$ years; 79.0% White]	100% OEF/OIF/OND	24.5	Full 25-day program	213 veterans	69 veterans	Naturalistic treatment study of patients engaged in an intensive multimodal inpatient PTSD EBP program; 25 days	CPT
Wolf et al. (2015) ^b	OEF/OIF/OND entire sample	69 veterans with PTSD and mild-to-severe TBI who had attended at least one PE session [94.2% male; $M_{Age} = 34.0 \pm 8.0$ years; 66.7% White]	100% OEF/OIF/OND	36.2	≥8 sessions	44 veterans [93.2% male; $M_{Age} = 34.7 \pm 8.3$ years; 65.9% White]	25 veterans [96.0% male; $M_{Age} = 32.9 \pm 7.5$ years; 68.0% White]	Retrospective; VHA chart review	PE
Yoder et al. (2012)	OEF/OIF/OND subsample	112 veterans with PTSD who were enrolled in PE [92.0% male; $M_{Age} = 41.0$ years; 58.0% White]	54.5% OEF/OIF/OND 30.4% Vietnam 15.2% Other	26.9	≥6 group sessions and ≥1 standard deviation change in PCL	94 veterans	18 veterans	Retrospective; VHA chart review	PE
Zalta et al. (2018) ^c	OEF/OIF/OND subsample	191 veterans with PTSD and military-related trauma engaged in an IOP [63.4% male; $M_{Age} = 30.9 \pm 6.1$ years; 68.1% White]	89.0% OEF/OIF/OND 11.0% Other	7.9	Full 15-day program	176 veterans	15 veterans	Naturalistic treatment study of patients engaged in an intensive cohort-based outpatient PTSD program; 15 days	CPT

Note. Study characteristic data included, as available within the respective published studies. Mean age (M_{Age}) and standard deviation and predominant race/ethnicity included, as available. OEF/OIF/OND = Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)/Operation New Dawn (OND); PTSD = posttraumatic stress disorder; VHA = Veterans Health Administration; PE = prolonged exposure therapy; CPT = cognitive processing therapy; CPT-C = cognitive processing therapy-cognitive; CT = cognitive therapy; CBT = cognitive behavioral therapy; TBI = Traumatic Brain Injury; TAU = treatment as usual; rTMS = repetitive transcranial magnetic stimulation; EBP = evidence-based psychotherapies; IOP = intensive outpatient program.

^a Data presented were secondary data analyses of Materitsch et al. (2016).

^b Data presented from this study included 51 veterans and 18 active-duty personnel.

^c Data presented from this study included 94% veterans and 6% active-duty personnel.

Table 2
Summary of Study Outcomes

Study	Sample Type	Relevant Findings
Belsher et al. (2015)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> When compared to a previous study examining the same cognitive-behavioral web-based intervention for posttraumatic stress, the current study sample had a greater dropout rate The composition of the current study sample also differed, such that this sample was <50% White, had a lower level of education, and was comprised of fewer students
Capone et al. (2018)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> When compared to other studies examining co-occurring PTSD and substance use disorders, the current study reported a higher dropout rate from treatment, which the authors attributed to the combination of individual and group therapy
Chard et al. (2010)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> While OEF/OIF/OND veterans demonstrated higher treatment dropout than Vietnam-era veterans (35% vs. 26%, respectively), this was not statistically significantly different OEF/OIF/OND veterans did not differ from Vietnam-era veterans by demographics or pretreatment CAPS, PCL, or BDI-II scores Treatment dropouts across service eras were not significantly different from treatment completers on age, years of education, race, marital status, or service-connection disability rating Treatment dropouts across service eras were not significantly different from treatment completers on CAPS total severity score, pretreatment PCL scores, or pretreatment BDI-II scores Reasons for treatment dropout across service eras included moving, substance relapse, unwillingness to complete assignments, nonattendance to sessions, work conflicts, and family burdens OEF/OIF/OND veterans demonstrated significantly lower posttreatment CAPS scores than Vietnam-era veterans, after controlling for pretreatment CAPS scores and a number of treatment sessions attended There was no difference between veteran cohorts in posttreatment PCL or BDI-II scores
Crocker et al. (2018)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> No differences in demographic, TBI, intellectual functioning, or memory variables between treatment completers and treatment dropouts Treatment dropouts had more severe PTSD symptoms and postconcussive symptoms at baseline Treatment dropouts performed more poorly than treatment completers on tests of executive functioning at baseline, including a test of novel problem-solving (WCST-64) and a test of cognitive flexibility (D-KEFS Trail Making number-letter switching). However, only the WCST-64 remained a significant predictor of dropout when controlling for baseline PTSD and postconcussive symptoms
Davis et al. (2013)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> Treatment dropout did not differ significantly for OEF/OIF/OND veterans with PTSD versus mTBI and PTSD While not statistically significant, there was a trend for OEF/OIF/OND veterans with mTBI and PTSD to attend an average of fewer CPT sessions versus those with PTSD (7.9 vs. 9.6, respectively) While not statistically significant, there was a trend for OEF/OIF/OND veterans with mTBI and PTSD to have early drop-out (defined as treatment dropout at or before session 4) versus those with PTSD (36.4% vs. 20.7%, respectively)
DeViva (2014)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> Treatment completers were more likely to be married, employed, and older than treatment noncompleters Treatment noncompleters were more likely to present with a co-occurring depressive disorder There were no significant differences between treatment completers and treatment dropouts on gender, race, or service connection status
Eftekhari et al. (2013)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> Treatment dropout across service eras was not predicted by baseline PTSD or depression symptomatology, but it was significantly predicted by identifying as female (38.7%) and reporting a primary trauma of MST (40%) Vietnam veterans were less likely to drop out of treatment than veterans of other eras, after controlling for age Treatment dropout reasons across service eras included: symptom improvement, increased distress, "other" (e.g., treatment avoidance, nonmedical scheduling conflicts, relocation), or "unknown." Among OEF/OIF/OND veterans who dropped out of treatment, the most common reason was either unknown or because of symptom improvement
Ford et al. (2018)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> All treatment dropouts occurred prior to the treatment midpoint (i.e., prior to session 4) Treatment dropout among OEF/OIF/OND veterans with PTSD and anger problems was higher for PE than TARGET TARGET completers more symptomatic and impaired at baseline than PE completers; significantly higher CAPS overall score, re-experiencing, and hyperarousal symptoms; more severe posttraumatic cognitions and intrusive memories, poorer emotion regulation, more severe psychiatric symptoms More TARGET completers met criteria for depression at baseline (67%) than PE completers All treatment dropouts across service eras occurred prior to the treatment midpoint (i.e., prior to week 6) Veterans in the PE delivered via iPhone condition had the greatest number of treatment dropouts (70%) Reasons cited for dropout across service eras included technological problems (e.g., bad cell service) and logistical issues (e.g., no quiet, undisturbed rooms in the house for therapy) OEF/OIF/OND veterans demonstrated the highest rate of dropout (57.1%) when compared to veterans that served in Vietnam (37.5%), Operation Desert Storm (50%), and those that were not deployed to a combat zone (50%)
Fryml et al. (2018)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> All treatment dropouts did so prior to initiating the treatment (i.e., immediately after the baseline assessment)
Garcia et al. (2011)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> Younger age and elevated TRT (negative treatment indicators) on the MMPI-2 significantly predicted treatment dropout Treatment dropouts did not significantly differ from treatment completers in terms of ethnicity, employment status, disability filing status, PTSD disability, or overall disability rating Veterans who participated in PE treatment were more likely to complete treatment than patients not offered PE

Table 2 (continued)

Study	Sample Type	Relevant Findings
Gros et al. (2018)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • 71.0% of participants across service eras that attended the first treatment session completed treatment, with dropout rates fairly consistent across the subsequent sessions • VA service-connected disability status (having a noted disability), treatment condition (telehealth), and last observed PCL score were statistically significant predictors of treatment dropout across service eras • The veteran service era was not significantly related to treatment dropout
Grubaugh et al. (2016)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • Younger veterans across service eras were more likely to discontinue treatment prior to session 5 than older veterans • OEF/OIF/OND veterans demonstrated the highest rate of dropout compared to veterans of other service eras • Black veterans were more likely to discontinue treatment prior to session 5 than White veterans across service eras • Those who discontinued treatment prior to session 5 demonstrated higher baseline PTSD symptom severity (via CAPS) compared to those who completed more than 5 sessions across service eras • Reasons for dropout across service eras included intensity of intervention, lack of interest, transportation problems, and work conflicts
Hundt et al. (2018)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • Identified treatment barriers across service eras included: <ul style="list-style-type: none"> • Practical reasons (57%; e.g., employment, college, family responsibilities) • Emotional reasons (43%; e.g., therapy is too difficult/stressful) • Therapy-related reasons (71%; e.g., lack of buy-in, poor therapeutic alliance, the patient referred to a higher level of care) • Systems-related reasons (14%; e.g., scheduling issues, limited hours, continuity of care, negative experiences with other providers) • Co-occurring barriers (e.g., emotional barriers strongly overlapped with treatment-related barriers) were cited by 90% of the participants across service eras • OEF/OIF/OND participant quotes included: <ul style="list-style-type: none"> • “When it came to the point where it was jeopardizing my job, you know, the therapy came later, man. I gotta get paid.” • “They just want to go into the past, but we need or what I need is how to cope with what I have right now, and then everyday civilian life, instead of just regressing and getting to the roots.” • “I couldn’t . . . relate because they were never in the military.”
Jeffreys et al. (2014)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • Veterans younger than 30 years old were significantly more likely to drop out of CPT and PE (when compared to veterans older than 30 years old), even when controlling for gender, ethnicity, and OEF/OIF/OND veteran status • OEF/OIF/OND veterans receiving CPT were three times more likely to drop out than members of other service eras • OEF/OIF/OND veterans receiving PE were not significantly more likely to drop out than members of other service eras. • Veterans were more likely to drop out of PE (44%) than CPT (32.2%) across service eras • Combined individual and group CPT demonstrated the lowest odds of dropout among the CPT conditions across service eras
Kehle-Forbes et al. (2016)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • The mean number of sessions attended by veterans who dropped out was 4.47 ($SD = 3.1$) and the mean number of sessions completed among treatment completers was 11.7 ($SD = 2.5$) across service eras • OEF/OIF/OND veterans were less likely to initiate treatment when compared to Vietnam veterans. However, this was not controlling for age • The therapist assignment was not a significant predictor of treatment dropout across service eras • Age was a significant predictor of treatment dropout, with veterans under 35 years more likely to dropout than veterans over 55 years, across service eras • Veterans receiving PE were more likely to drop out than those receiving CPT across service eras • OEF/OIF/OND veterans were more likely to drop out of treatment when compared to Vietnam veterans. However, this was not controlling for age • Approximately 60% of eligible OEF/OIF/OND veterans either failed to initiate or dropped out of either CPT or PE
Kozel et al. (2018)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> • Treatment dropouts demonstrated significantly higher PCL scores, less formal education, lower WASI scores, and were more likely to be current college students when compared to treatment completers • The majority of treatment dropouts did so prior to session 5 (sessions 4 and 5 involved trauma accounts)
Lamkin et al. (2019)*	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> • 14.4% of participants dropped out of treatment after zero or one session; 31.0% of participants dropped out of treatment prior to completing six sessions • Treatment dropouts that discontinued after zero or one sessions were not statistically different from the rest of the sample in terms of PTSD symptom severity (via PCL-IV), personality traits (submissiveness, affective lability, or compulsivity), age, gender, marital status, employment, current psychiatric medications, psychiatric treatment history, level of education, or treatment modality (i.e., in-person CPT or video telehealth CPT)
Maiers et al. (2016)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> • Treatment modality (in-person CPT vs. video telehealth CPT) was not statistically related to treatment dropout • While there was a low response from veterans when inquired about factors contributing to treatment dropout, some declined participation due to time constraints from school, family, or work
Mott et al. (2014)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • Non-OEF/OIF/OND veteran status and service connection for PTSD significantly predicted treatment initiation • Among those who began treatment, OEF/OIF/OND veteran status and a history of psychiatric inpatient hospitalization significantly predicted treatment dropout

(table continues)

Table 2 (continued)

Study	Sample Type	Relevant Findings
Schumm et al. (2017)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • For the first course and second course of EBP treatment, there was not a significant difference in dropout rates between those that received CPT versus PE or CBT for PTSD across service eras • Treatment dropouts were significantly younger, more likely to serve in OEF/OIF/OND, less likely to be married, and more likely to have a substance use disorder than treatment completers • Treatment dropouts did not significantly differ on any other demographic or pretreatment variables from treatment completers • Treatment dropouts that repeated treatment were more likely to be married than treatment dropouts that did not repeat treatment • Treatment completers that repeated treatment were more likely to be employed than treatment completed that did not repeat treatment • For treatment repeaters, there was no significant relationship between dropout status and achievement of clinically significant change in PTSD symptom severity • For treatment nonrepeaters, those who dropped out were less likely to achieve clinically significant change in PTSD symptom severity than treatment completers
Smith et al. (2015)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • OEF/OIF/OND veterans had the lowest rate of dropout (18.8%), compared to Vietnam (24.4%) and Persian Gulf War (75%) veterans • Treatment completers attended an average number of 10.0 ($SD = 1.8$) group sessions and 4.7 ($SD = 1.9$) individual sessions across service eras • Treatment dropouts attended an average number of 3.3 ($SD = 2.1$) group sessions and 0.2 ($SD = 0.4$) individual sessions across service eras • Treatment dropouts demonstrated higher pretreatment PTSD symptom severity and were less likely to have combat exposure than treatment completers across service eras
Szafranski et al. (2014)	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> • Treatment dropout was significantly predicted by reduced symptom improvement during treatment, reduced improvement in overall functioning from admission to discharge, and higher concurrent drug use at admission
Wolf et al. (2015)**	OEF/OIF/OND entire sample	<ul style="list-style-type: none"> • In terms of PTSD symptom severity, 40.0% of treatment dropouts demonstrated reliable reduction in PCL-IV scores (vs. 95.5% of treatment completers), and 16.0% demonstrated clinically significant change on the PCL-IV (vs. 86.4% of treatment completers) • The average PCL-IV score change in treatment dropouts was $M = 8.1$ ($SD = 13.5$) and $M = 28.7$ ($SD = 11.3$) among treatment completers • In terms of depression symptom severity, 40.0% of treatment dropouts demonstrated a reliable reduction in BDI-II scores (vs. 90.5% of treatment completers), and 12.0% demonstrated clinically significant change on the BDI-II (vs. 54.8% of treatment completers) • The average BDI-II score change in treatment dropouts was $M = 5.4$ ($SD = 10.6$) and $M = 15.2$ ($SD = 10.3$) among treatment completers
Yoder et al. (2012)	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • While OEF/OIF/OND veterans were significantly less likely to complete treatment when compared to other service eras, there was no significant difference found in the number of sessions attended by OEF/OIF/OND, Vietnam, and Persian Gulf war veterans • No significant differences were found in pretreatment PTSD (via PCL-M) or depression (via BDI-II) symptom severity between treatment completers and non-completers across service eras
Zalta et al. (2018)***	OEF/OIF/OND subsample	<ul style="list-style-type: none"> • Veterans that dropped out of treatment were not significantly different in terms of gender or service era, when compared to treatment completers • Reasons for treatment dropout across service eras included avoidance, family obligations, perceived lack of improvement, verbal and physical aggression, and medical problems

Note. SD = standard deviation; OEF/OIF/OND = Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)/Operation New Dawn (OND); PTSD = posttraumatic stress disorder; PE = prolonged exposure therapy; CPT = cognitive processing therapy; CAPS = Clinician-Administered Posttraumatic Stress Scale; PCL-IV = PTSD Checklist for DSM-IV; BDI-II = Beck Depression Inventory-II; WCST-64 = Wisconsin Card Sorting Test 64 Card Version; D-KEFS = Delis-Kaplan Executive Function System; mTBI = mild Traumatic Brain Injury; MST = military sexual trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; MMPI-2 = Minnesota Multiphasic Personality Inventory-2.

* Data presented were secondary data analyses of Maieritsch et al. (2016).

** Data presented from this study included 51 veterans and 18 active-duty personnel.

*** Data presented from this study included 94% veterans and 6% active-duty personnel.

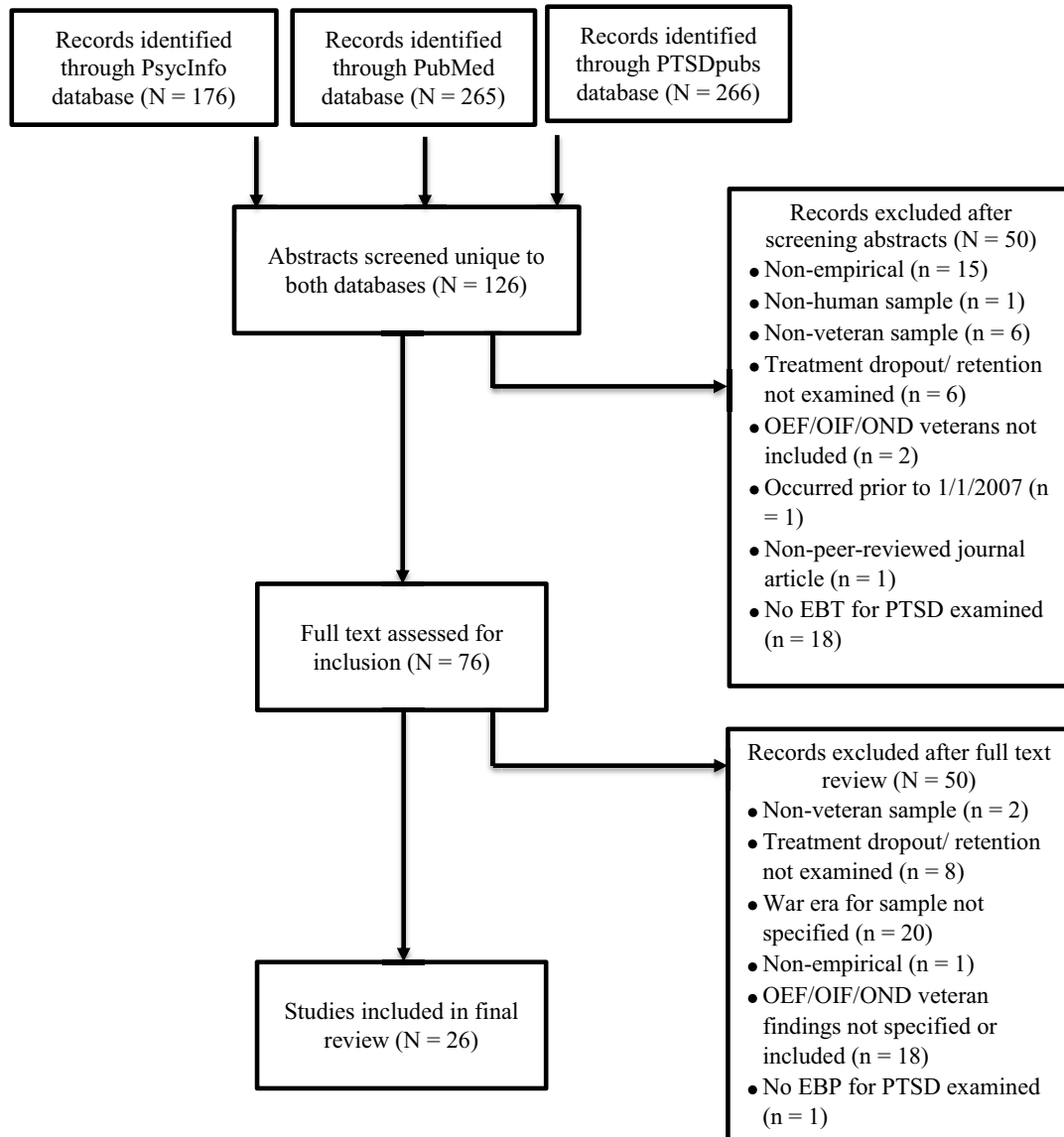
several instances in which findings were found to be consistent, despite differences in study design (e.g., practical concerns).

Demographic Characteristics

Research examining differences in pretreatment characteristics and treatment response among veterans across service eras has generally been mixed or underexamined; OEF/OIF/OND veterans are no exception. For instance, there is limited research examining gender differences in relation to treatment dropout

among OEF/OIF/OND veterans. Among studies in which the veteran samples were primarily comprised of post-9/11 veterans, one study found female gender was associated with premature discontinuation of therapy (Eftekhari et al., 2013); whereas other studies did not find gender to be a significant predictor of dropout (DeViva, 2014; Zalta et al., 2018). Thus, although there is a larger percentage of women who served during OEF/OIF/OND as compared to previous service eras, it remains unclear how gender may influence treatment dropout among veterans of this cohort.

Figure 1
Flow Chart of Step in Systematic Review



Findings regarding the impact of race on treatment dropouts have also been mixed. One study reported that Black veterans were more likely to discontinue treatment prior to session five of PE than White veterans across service eras (Grubaugh et al., 2016). In contrast, in a chart review of consecutively enrolled OEF/OIF/OND veterans initiating PE or CPT, race was not found to be a significant predictor of treatment dropout (DeViva, 2014).

Additional demographic variables that have been less studied include marital status, employment status, and level of education. Research that has examined these factors has been mixed and found trauma-focused treatment completers were more likely to be married and employed (DeViva, 2014; Schumm et al., 2017) and less likely to have a level of education greater than high school/GED (Belsher et al., 2015; Kozel et al., 2018), whereas other studies found no

differences based on the level of education (Chard et al., 2010; Lamkin et al., 2019).

Of the demographic factors studied more extensively, one finding that has remained consistent was that younger age predicted treatment dropout among OEF/OIF/OND veterans (e.g., DeViva, 2014; Garcia et al., 2011; Jeffreys et al., 2014; Kehle-Forbes et al., 2016). Specifically, the research identified that age younger than 35 (Kehle-Forbes et al., 2016) or 30 years (Jeffreys et al., 2014) was associated with increased risk for treatment dropout when compared to veterans of this cohort who were 50 (Jeffreys et al., 2014) or 55 years of age (Kehle-Forbes et al., 2016) or older. Younger age has also been associated with treatment dropout across levels of care, including among male OEF/OIF/OND veterans participating in a voluntary inpatient CPT-based program (Szafanski et al., 2014). Conversely,

Table 3
Quality Assessment Appraisal Tool and Individual Study Results

Reference	V1	V2	V3	V4	V6	V7	R8	R9	R10	R11	R12	A13	A15	16	Total
Belsher et al. (2015)	1	1	0	1	1	1	0	1	0	0	1	1	1	0	9
Capone et al. (2018)	1	1	0	1	1	1	0	1	1	1	1	1	1	1	12
Chard et al. (2010)	0	1	0	1	1	1	0	1	0	0	1	1	1	0	8
Crocker et al. (2018)	1	1	0	1	1	1	1	1	1	1	1	1	1	1	13
Davis et al. (2013)	1	1	0	1	1	1	0	1	1	0	1	1	1	0	10
DeViva (2014)	1	1	0	1	1	1	0	1	1	1	1	1	1	0	11
Eftekhari et al. (2013)	0	1	0	1	1	1	1	1	1	1	1	1	1	0	11
Ford et al. (2018)	1	1	0	1	1	1	0	1	0	1	1	1	1	1	11
Franklin et al. (2017)	0	1	0	1	1	1	0	1	1	1	1	1	1	1	11
Fryml et al. (2018)	1	1	1	1	1	1	0	1	1	0	1	1	1	1	12
Garcia et al. (2011)	1	1	0	1	1	1	0	1	1	1	1	1	1	0	11
Gros et al. (2018)	1	1	0	1	1	1	1	1	1	1	1	1	1	1	13
Grubaugh et al. (2016)	0	1	0	1	1	1	0	1	0	1	1	1	1	0	9
Hundt et al. (2018)	0	1	0	1	1	1	1	1	1	0	1	1	1	0	10
Jeffreys et al. (2014)	0	1	0	1	1	1	1	1	1	1	1	1	1	0	11
Kehle-Forbes et al. (2016)	0	1	0	1	1	1	1	1	1	1	1	1	1	0	11
Kozel et al. (2018)	1	1	0	1	1	1	0	1	0	0	1	1	1	1	10
Lamkin et al. (2019)	1	1	0	1	1	1	0	1	1	1	1	1	1	0	11
Maieritsch et al. (2016)	1	1	0	1	1	1	0	1	0	1	1	1	1	1	11
Mott et al. (2014)	0	1	0	1	1	1	0	1	1	1	1	1	1	0	10
Schumm et al. (2017)	0	1	0	1	1	1	0	1	1	1	1	1	1	0	10
Smith et al. (2015)	0	1	0	1	1	1	1	0	1	0	1	1	1	0	9
Szafranski et al. (2014)	1	1	0	1	1	1	0	1	1	1	1	1	1	0	11
Wolf et al. (2015)	1	1	0	1	1	1	1	1	1	1	1	1	1	0	12
Yoder et al. (2012)	0	1	0	1	1	1	0	1	0	0	1	1	1	0	8
Zalta et al. (2018)	0	1	0	1	1	1	0	1	0	0	1	1	1	0	8

Note. This quality assessment tool was adapted from: LEGEND: Evidence appraisal of a single-study etiology, risk factors, incidence cohort study: prospective or retrospective (Cincinnati Children's Hospital Medical Center, 2006–2012). Higher scores indicate greater study quality (1 = yes; 0 = no). Two items were removed: (A5) If the study addresses causation, was there a plausible association between exposure and outcome? (A14) Are my patient's and family's values and preferences satisfied by the knowledge gained from this study?.

in a comparison of OEF/OIF/OND veterans and Vietnam-era veterans engaging in CPT, demographic variables, including age, did not predict treatment dropout or completion (Chard et al., 2010). Overall being 35 years old or younger emerged as the most consistent demographic predictor of treatment dropout across studies.

Psychological Factors

Despite research identifying a high prevalence of mental health difficulties among OEF/OIF/OND veterans (e.g., Brown et al., 2016; Fontana & Rosenheck, 2008; Fulton et al., 2015), few studies have examined psychological factors related to treatment dropout. Moreover, the findings are mixed regarding the impact of certain psychological factors. For example, some studies have found that both greater PTSD symptom severity (Crocker et al., 2018; Garcia et al., 2011; Grubaugh et al., 2016; Kozel et al., 2018; Smith et al., 2015) and overall distress (Lamkin et al., 2019) were associated with treatment dropout among OEF/OIF/OND veterans, whereas other studies have found no differences in pretreatment assessment measures when comparing OEF/OIF/OND veterans to other veteran cohorts (Chard et al., 2010; Davis et al., 2013; Eftekhari et al., 2013; Yoder et al., 2012). Consequently, it has been suggested that pretreatment PTSD symptom severity not be used to predict the risk of individual patient dropout (Chard et al., 2010). Additionally, research has suggested higher rates of treatment dropout from PE and CPT among OEF/OIF/OND veterans presenting with PTSD and co-occurring depression (DeViva, 2014).

Having a service-connected disability has also demonstrated mixed results. Whereas in one study having a service-connected disability predicted treatment dropout (Gros et al., 2018), in others it has not been associated with increased dropout among OEF/OIF/OND veterans (Chard et al., 2010; DeViva, 2014; Szafranski et al., 2014).

Findings regarding psychiatric medications and treatment history are also mixed. One study noted that veterans who dropped out of treatment were not different from those who completed treatment in terms of current psychiatric medications or psychiatric treatment history (Lamkin et al., 2019). However, another study found that a history of psychiatric inpatient hospitalization significantly predicted treatment dropout (Mott et al., 2014), which suggests that psychiatric history may be relevant when assessing risk for treatment dropout. Finally, among those studies examining substance use, concurrent substance use and substance use diagnoses were found to be consistently associated with high rates of treatment dropout (Capone et al., 2018) and to predict treatment dropout (Chard et al., 2010; Schumm et al., 2017; Szafranski et al., 2014). Taken together, increased research examining the effects of concurrent psychological factors on treatment dropout among OEF/OIF/OND veterans may increase our understanding of this vulnerable and unique cohort.

Cognitive Factors

High rates of postconcussive symptoms have been observed among OEF/OIF/OND veterans (Helmer et al., 2009; Lew et al.,

2009). Indeed, research has found that poorer baseline executive functioning (i.e., greater severity of postconcussive symptoms and poorer performance on tests of executive functioning) was associated with greater treatment dropout among OEF/OIF/OND veterans receiving CPT (Crocker et al., 2018). Investigators have also examined the role of mild Traumatic Brain Injury (mTBI) among OEF/OIF/OND veterans. Although the findings were nonsignificant, one study found that OEF/OIF/OND veterans presenting with PTSD alone, as compared to those presenting with PTSD and mTBI (PTSD/mTBI), attended, on average, approximately two more CPT sessions (Davis et al., 2013). This study also found a trend for veterans with PTSD/mTBI to have higher rates of dropout prior to CPT session 4, as compared to veterans with PTSD only (Davis et al., 2013). Finally, one study found that treatment dropout was significantly related to lower scores on a clinician-administered intellectual test (Kozel et al., 2018). It has been postulated that this emerging research suggests that problems with executive functioning may contribute to other difficulties, such as planning and overcoming logistical barriers to treatment, potentially contributing to the increased risk of dropout (Crocker et al., 2018).

Practical Concerns

Practical concerns unique to this veteran cohort may further complicate the problem of overcoming logistical barriers to treatment adherence and have been consistently related to treatment dropout. For example, one study comparing CPT delivered in-person versus via telemental health (TMH) found that veterans declined participation in treatment due to an array of practical issues such as time constraints from school, family, and work (Maieritsch et al., 2016). The authors hypothesized that managing multiple life roles and responsibilities, including attending work, school, and raising a family may interfere with consistent treatment attendance, regardless of treatment condition (Maieritsch et al., 2016). Relatedly, veterans have also identified family responsibilities as taking priority over seeking treatment (Hundt et al., 2018; Zalta et al., 2018), highlighting the importance of practical concerns related to childcare and parenting when coordinating scheduling and expectations for treatment attendance. Of note, one study examining the effectiveness of a cognitive-behavioral web-based intervention for posttraumatic stress symptoms found higher rates of treatment dropout from this eight-session self-management course when the sample contained few students, as compared to when the author evaluated the effectiveness of the treatment using a sample comprised of all students (Belsher et al., 2015).

Conflicts with work and school have also been identified as contributing to treatment dropout among OEF/OIF/OND veterans in a qualitative study exploring reasons for treatment dropout (Hundt et al., 2018). Finally, research examining practical concerns for veterans completing EBPs across service eras has identified scheduling conflicts, relocation, transportation problems, and concurrent medical problems as contributing to treatment dropout (Eftekhari et al., 2013; Grubaugh et al., 2016; Zalta et al., 2018).

Treatment-Related Factors

A myriad of treatment-related factors, including treatment type, treatment format, and treatment modality, have been found to impact treatment dropout. For the purposes of this review, treatment type

refers to the individual EBP employed (e.g., PE and CPT), treatment format refers to the context in which the treatment was delivered (i.e., individual vs. group), and treatment modality refers to the method of delivery (e.g., in-person, intensive treatment [i.e., sessions delivered more than twice weekly], group, TMH). When examining reasons OEF/OIF/OND veterans provided for why they dropped out of PE, researchers found that symptom improvement was the most common reason veterans cited for discontinuing treatment (Eftekhari et al., 2013). Research examining concurrent EBPs for PTSD (i.e., CPT and PE) and repetitive transcranial magnetic stimulation (rTMS) among OEF/OIF/OND veterans found that treatment dropout occurred prior to initiating treatment for PE (Fryml et al., 2018), or prior to being assigned the trauma account in CPT (Kozel et al., 2018). Although evaluating treatment dropout in these studies was not a primary aim, these findings might suggest that dropout was not due to the intervention type, but rather other factors.

According to a qualitative study examining reasons for dropout, OEF/OIF/OND veterans self-reported the following as common reasons for treatment dropout: perceiving PE or CPT as “too difficult” or “stressful,” endorsing lack of “buy-in” to the treatment rationale, objecting to completing between-session assignments, misunderstanding of the therapy, and alliance issues with a provider (Hundt et al., 2018). In the same vein, studies examining treatment dropout across veteran service eras found that factors such as unwillingness to complete homework assignments, nonattendance to sessions, and the lack of interest predicted treatment dropout (Chard et al., 2010; Grubaugh et al., 2016). One study examined the impact of therapist assignment across veteran cohorts completing CPT or PE, finding that the therapist assignment was not predictive of treatment dropout (Kehle-Forbes et al., 2016). Lastly, research comparing outcomes of PE to an affect regulation skills-focused intervention among OEF/OIF/OND veterans found that veterans engaging in PE completed one-third fewer sessions than those in the skills-focused intervention, despite the veterans in the skill-focused group having had greater baseline symptom severity (Ford et al., 2018). This may suggest that certain treatment types could impact dropout relative to non-trauma-focused treatments. Considered jointly, the impact of treatment type on dropout remains unclear.

Only one study examined the delivery of an EBP for PTSD among OEF/OIF/OND veterans while incorporating a group component. Capone and colleagues (2018) delivered an integrated CBT intervention for veterans with co-occurring PTSD and substance use and found higher rates of treatment dropout when compared to other concurrent treatments. The authors attributed the higher dropout rate (61.9%) to the format of treatment delivery (i.e., a combination of individual and group therapy).

Method of treatment delivery may also be important when considering factors associated with treatment dropout among this cohort of veterans. For instance, when comparing CPT delivered in-person and via TMH, researchers found comparable dropout rates across the two conditions, suggesting the method of treatment delivery did not significantly impact treatment dropout (Maieritsch et al., 2016). Subsequent research using a combined sample of veterans from multiple service eras, however, found higher rates of dropout from PE delivered via TMH (Franklin et al., 2017; Gros et al., 2018), with OEF/OIF/OND veterans having worse treatment retention overall (Franklin et al., 2017). In a cognitive-behavioral web-based intervention for posttraumatic stress, the reported

treatment completion rate was also reported to be low, with 50% of participants completing five or more (of eight total) sessions, and 33% completing the full treatment (Belsher et al., 2015). Upon further examination of treatment dropout for veterans enrolled in TMH, technological issues (e.g., connection problems) and logistical concerns (e.g., lack of private and quiet space) have been frequently cited as reasons for dropout (Franklin et al., 2017).

Regarding session frequency, research examining intensive treatment delivery (i.e., treatment delivered more than twice weekly) has demonstrated positive results in regard to treatment retention (e.g., Foa et al., 1980; Gutner et al., 2016). Indeed, two studies examining intensive CPT programs among veterans, both at the outpatient and inpatient level, cited the lowest dropout rates among studies included in the current review (24.5% and 7.9%), further suggesting that attending sessions more frequently may reduce treatment dropout (Szafranski et al., 2014; Zalta et al., 2018). It should be noted that one of these studies included a mixed sample of veterans from multiple service eras; it was included because 89% of the sample was identified as OEF/OIF/OND veterans.

Discussion

EBPs for PTSD are increasingly utilized in the VA; however, many veterans' mental healthcare needs to go unmet because they do not complete treatment. Given the complexities of the OEF/OIF/OND veteran's unique military experiences and clinical presentations, it is important for VA clinicians to be aware of the risk factors for treatment dropout in order to facilitate the successful completion of treatment. Moreover, as OEF/OIF/OND veterans have been frequently identified to be at a greater risk of prematurely discontinuing treatment when compared to veterans of other service eras (Eftekhari et al., 2013; Grubaugh et al., 2016; Kehle-Forbes et al., 2016; Mott et al., 2014; Schumm et al., 2017; Yoder et al., 2012), keen assessment of additional risk factors is needed.

This review expanded upon the current literature by identifying risk factors for treatment dropout from EBPs for PTSD specific to the OEF/OIF/OND cohort. Two consistent findings of studies included in this review was that younger age (i.e., 30–35 years old and younger; e.g., Jeffreys et al., 2014; Kehle-Forbes et al., 2016; Szafranski et al., 2014) and practical concerns—often associated with balancing multiple life roles (e.g., Maieritsch et al., 2016; Hundt et al., 2018; Mott et al., 2014)—may increase the risk of treatment dropout. Of note, age was found to be a significant predictor of treatment dropout across retrospective chart review and naturalistic studies, whereas practical concerns emerged as consistent predictors of treatment dropout regardless of study design (i.e., retrospective chart review and RTC). Although offering TMH services may seem to be a logical treatment option to address these concerns, research on TMH and dropout among OEF/OIF/OND veterans is mixed, and some studies have observed an increased rate in dropout from EBPs for PTSD delivered via TMH when compared to in-person appointments in two RCTs (Franklin et al., 2017; Gros et al., 2018). Instead, increasing the session frequency of the intervention, which would require veterans to endure several weeks of possible inconvenience and balancing of appointments rather than several months of appointments, may be an alternative method of treatment delivery. Such intensive interventions have found high levels of treatment completion across populations and trauma types (see Sciarrino et al., 2020 for a review) and have been

associated with a reduced dropout rate from PTSD treatments among veterans, including OEF/OIF/OND veterans when evaluated in a naturalistic treatment setting (Szafranski et al., 2014; Zalta et al., 2018). Alternatively, offering in-person afterhours appointments for veterans managing multiple responsibilities may aid in reducing the dropout rate, although to our knowledge, no studies to date have examined treatment noncompletion among OEF/OIF/OND veterans engaging in afterhours appointments. Future research should explore how opportunities for afterhours appointments may influence treatment dropout.

The therapeutic alliance and treatment buy-in were factors identified as contributing to treatment dropout (Hundt et al., 2018). Although Hundt et al. (2018) did not examine how these factors may improve treatment retention, both are worthy of consideration. Future research should examine the impact of the therapeutic alliance, and the veteran's understanding of the treatment rationale to promote buy-in as possible vehicles for improving treatment retention. Moreover, one study included in this review found a lower dropout rate when initiating an affect regulation skills treatment versus PE (Ford et al., 2018), which may suggest that certain aspects of the intervention employed may contribute to treatment dropout or retention with this population. Future research should examine initiating a trauma-focused skills intervention compared to an EBP for PTSD among veterans who are of younger age and with multiple roles (i.e., OEF/OIF/OND veterans at risk for treatment dropout) to determine whether this may facilitate engagement in a subsequent EBP. Finally, while limited, studies included in this systematic review consistently found that concurrent substance use predicted treatment dropout (Chard et al., 2010; Schumm et al., 2017; Szafranski et al., 2014). Thus, clinicians may opt for integrative treatment approaches, such as Concurrent Treatment of PTSD and Substance Use Disorders using Prolonged Exposure (COPE; Back et al., 2015) to address both trauma-related symptoms and substance use simultaneously in an effort to reduce treatment dropout.

Limitations

First, the current study did not operationalize “dropout,” rather this review referred to “dropout” as it was defined in each individual study. Therefore, it is important to consider how differing definitions of treatment dropout across studies may have influenced the (mixed) findings synthesized by the current review. Additionally, although this review sought to capture factors that increase the risk of dropout from EBPs for PTSD pertaining to OEF/OIF/OND veterans, no studies examining EMDR, WET, NET, BET, or CT for PTSD met all inclusion criteria, and studies examining CBT for PTSD varied greatly in treatment content and delivery. Therefore, it is unclear how the factors discussed in the current review generalize to veterans engaging in other empirically supported trauma-focused treatments. For instance, previous research examining WET has found that WET resulted in a lower rate of treatment dropout compared to CPT in a mixed sample of veterans and nonveterans (Sloan et al., 2018). Future research should examine the dropout rate among OEF/OIF/OND veterans specifically to determine how these findings may vary and may impact this at-risk group. Moreover, the existing literature is limited by linear and independent examinations of factors contributing to treatment dropout; therefore, the combined effects of these factors are unknown. The causes of treatment

dropout are likely to be complex and multifactorial, and understanding the causes of treatment dropout is likely to be best achieved through the lens of nonlinear dynamic systems theories and models. As a result, we were unable to examine the cumulative impact of multiple factors contributing to treatment dropout in this review due to the paucity of research in this area.

Research examining veterans of various service eras often examined whether there was a difference in dropout rate between veteran cohorts, and subsequent analyses examined risk factors associated with dropout for the entire sample for the remainder of analyses (e.g., Grubaugh et al., 2016; Schumm et al., 2017). Therefore, although several studies identified a higher dropout rate among OEF/OIF/OND veterans, specific risk factors for this cohort are not consistently evaluated in individual studies and these risk factors are instead examined generally for the total sample. Given the higher dropout rate among the OEF/OIF/OND veteran cohort, it is imperative to examine additional risk factors that distinguish this cohort from other veteran service eras. Lastly, biological factors may also contribute to rates of treatment dropout for veterans in PTSD treatment. Past research has found an association between smaller hippocampal volume and treatment dropout in people with persistent PTSD (Rubin et al., 2016); however, we were unable to identify studies linking biological factors to PTSD treatment dropout among OEF/OIF/OND veterans. Future studies could further examine this link.

Future Directions

Future research utilizing large-scale databases that incorporate demographic, psychological and biological factors including neural, genetic, and hormonal data may increase our understanding into the mixed findings among identified risk factors associated with treatment dropout in OEF/OIF/OND veterans with PTSD. Specifically, further research should examine the role of variables such as comorbid psychological disorders, interpersonal trust, attachment style, and emotion regulation on treatment dropout. Moreover, past research has identified veterans with high scores on certain PTSD clusters (e.g., avoidance) as being more likely to drop out of treatment (Miles et al., 2015); as such, future research should examine specific PTSD symptom cluster associations to treatment dropout. Research is also limited in its examination of the location of care in which EBPs are delivered with OEF/OIF/OND veterans. Examining differences among residential treatment centers, community-based outpatient clinics (CBOC), and VA hospitals on treatment dropout may highlight contextual factors contributing to dropouts, such as seeking treatment in a specialty clinic, removal of environmental stressors, or distance to the facility. Moreover, examining differences among veterans seeking treatment in different settings may provide insights associated with self-selecting into specific treatment settings. Finally, more qualitative studies examining the reasons why veterans drop out of treatment are needed.

As previously noted, the current literature on treatment dropout is less likely to consider the cumulative effect of these risk factors, yet clinicians frequently encounter veterans with multiple risk factors. For example, does being younger *and* having cognitive difficulties magnify the risk of treatment dropout compared to being younger or having cognitive difficulties, alone? Future research could expand upon the current literature to examine the cumulative effect of complex presentations on treatment dropout may help answer these

questions. Eventually, this area of research may be synthesized to facilitate the development of veteran and clinician user-friendly algorithms (with accompanying clinical guidelines), which incorporate key variables (e.g. age, practical concerns, psychosocial stressors, and treatment choice) to help clinicians and researchers identify OEF/OIF/OND veterans at various levels of risk for treatment dropout.

As is evident from the current review, research into treatment retention in EBP treatments for OEF/OIF/OND veterans with PTSD is warranted. This may involve researchers more explicitly shifting their focus to examine factors that may contribute to treatment retention, rather than hypothesizing based on findings associated with treatment dropout. Recent research has highlighted a relationship between factors such as social support (Meis et al., 2010), a veteran's need for treatment (Fleming et al., 2018), and intensive treatment delivery (Zalta et al., 2018) as contributing to EBP treatment retention. However, there are few if any studies that investigate a wide-ranging, comprehensive list of factors that could enhance treatment retention in this specific and unique population of OEF/OIF/OND veterans. For example, adjunctive treatments may be useful in improving treatment retention among veterans with multiple risk factors, such as support groups for veterans with similar life circumstances. Facility adjustments might also be important to consider in regard to improving treatment retention. For instance, future studies could examine whether the provision of childcare services of afterhours appointment offerings mitigate the risk for treatment dropout. Additionally, investigating the fit between veteran and provider and veteran's predominant trauma-related symptoms and EBP selected may also be avenues for future research in the area of treatment retention. Nevertheless, the cost of treatment dropout for veterans and for the VA is large, and investing in research focused on improving EBP treatment retention could be beneficial to the lives of many veterans.

Conclusions

Veterans drop out of EBPs for PTSD for many reasons, including demographic characteristics, psychological factors, cognitive factors, practical concerns, and therapy-related factors. Perhaps because each veteran with PTSD is unique, the current literature is mixed about many of these findings, and much of the research on treatment dropout continues to examine veterans of multiple cohorts conjointly. Thus, continued research into the specific causes of treatment dropout and cumulative effects of risk factors for treatment dropout among OEF/OIF/OND veterans is warranted. The literature is limited on suggestions for retaining OEF/OIF/OND in PTSD treatment, and future research should explore additional methods of improving treatment retention among this cohort of veterans. Clinicians who are aware of, and implement strategies that protect against treatment dropout will likely have more success in helping OEF/OIF/OND veterans successfully recover from PTSD.

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