High rates of PTSD treatment dropout: A possible red herring?☆

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ABSTRACT

Few studies have examined symptom change among dropouts from posttraumatic stress disorder (PTSD) treatment. However, dropout is widely considered a negative event needing to be addressed. The present study investigated PTSD and depression symptom change in patients with PTSD who discontinued psychotherapy. Female civilians ($n = 321$) diagnosed with PTSD participated in two randomized clinical trials examining PTSD treatment outcomes. Of those, 53 were identified as dropouts and included in this study. Symptom change was assessed by clinically significant change (CSC) criteria and symptom end-state criteria. Results demonstrated that considerable proportions of participants (35.85–55.56%) displayed significant improvement and/or met good end-state criteria for PTSD and depression. Results also revealed that participants who displayed symptom improvement were younger, attended more treatment sessions, were married or partnered, and had higher annual household income. Although preliminary, these findings contradict belief that treatment dropouts do not display symptom improvement.

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1. Introduction

Posttraumatic stress disorder (PTSD) is an accumulation of aversive recollections, avoidant behaviors, maladaptive cognitions and heightened emotional and arousal symptoms resulting from experiencing or witnessing a life threatening or violent event (American Psychiatric Association, 2013). Within the United States, the lifetime prevalence rate for PTSD is 8.0%, with women displaying significantly higher rates (11.7%) than men (4.0%; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). In recent years, PTSD has gained increased attention as the relationship between

PTSD and impairment has become better understood. For instance, individuals with PTSD often display deficits in social (Frueh, Turner, Beidel, & Cahill, 2001), occupational (Taylor, Wald, & Asmundson, 2006) and overall health functioning (Jakupcak, Luterek, Hunt, Conybeare, & McFall, 2008), along with decreases in quality of life (Gill et al., 2014). Moreover, individuals with PTSD are at greater risk for suicide, especially if they present with comorbid depression (Ramsawh et al., 2014).

Fortunately, treatments such as *Cognitive Processing Therapy* (CPT; Resick & Schnicke, 1993) and *Prolonged Exposure* (PE; Foa, Hearst, Dancu, Hembree, & Jaycox, 1994) have been shown to be successful in reducing PTSD symptoms among treatment completers in both civilian (Resick, Nishith, Weaver, Astin, & Feuer, 2002) and Veteran populations (Goodson, Lefkowitz, Helstrom, & Gawrysiak, 2013; Monson et al., 2006). However, recent concerns have been raised about high dropout rates within these gold-standard treatments for PTSD (Gros, Price, Yuen, & Acierno, 2013; Najavits, 2015; Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008; Steenkamp, Litz, Hoge, & Marmar, 2015; Szafranski, Gros, Menefee, Norton, & Wanner, 2015). In a recent meta-analysis examining trauma-specific PTSD treatments, the average dropout rate was 36% (Imel, Laska, Jakupcak, & Simpson, 2013). However, PTSD dropout rates vary greatly across studies, with rates ranging from 28% to 68% (Gros et al., 2013; Garcia, Kelley, Rentz, & Lee, 2011). To date, type of treatment (e.g., exposure vs. non-exposure

has yet to predict dropout (Goetter et al., 2015). However, dropout is almost universally considered to be a bad outcome.

A likely contributor to the variability of dropout rates is the lack of clear and consistent definition of dropout (Schottenbauer et al., 2008). A variety of definitions of dropout have been used, including participants not attending a specific number of sessions (Gros et al., 2013; Tuerk et al., 2013), loss of contact with participants for a specific number of months (Erbes, Curry, & Leskela, 2009) or voluntary termination prior to achieving predetermined treatment goals, regardless of the number of sessions attended (Garcia et al., 2011; Szafranski et al., 2015). To further compound the problem, a number of treatment studies provide vague descriptions or fail to define dropout entirely (Hembree et al., 2003; Hoge et al., 2014; Teng et al., 2008).

A second limitation within the literature is the dearth of studies examining how symptoms change among dropouts. A widely held belief is that participants who drop out of treatment do not display decreases in PTSD symptomology (Tuerk et al., 2013). However, some researchers have hypothesized that although a large portion of dropouts do not improve, there may be a subset of individuals who display rapid improvement, thus leading to early termination from PTSD treatment (Erbes et al., 2009). Unfortunately, this hypothesis remains largely unexamined as the vast majority of studies have focused on factors outside of symptom change as predictors PTSD dropout due to the lack of available data on symptom change during the course of treatment (e.g., only pre- and post-treatment data for completers). Within the current body of literature, some of the more consistent predictors of PTSD treatment dropout include younger age (Gros, Yoder, Tuerk, Lozano, & Acierno, 2011; Kehle-Forbes, Meis, Spoont, & Polusny, 2015; Szafranski et al., 2016), lower income (Galovski, Blain, Mott, Elwood, & Houle, 2012), lower social support (Gros et al., 2013), and higher pretreatment symptom severity (Garcia et al., 2011). However, these factors have shown to account for only part of the variance explaining dropout from PTSD treatments. This suggests other unexamined factors that negatively effect PTSD treatment completion likely remain. Some studies have found more pragmatic reasons for dropping out such as changes in family demands, jobs, or housing (Szafranski et al., 2015; Teng et al., 2008).

Few studies have specifically examined PTSD symptom change as it pertains to treatment completion and/or dropout (Galovski et al., 2012; Szafranski et al., 2014; Tuerk et al., 2013). In a study examining predictors of length of stay among inpatient PTSD non-completers, less PTSD symptom improvement predicted shorter length of stay (Szafranski, Gros, Menefee, Wanner, & Norton, 2014). Szafranski et al. hypothesized that participant motivation to continue treatment reduced among individuals with minimal symptom reduction and suggested incorporating techniques such as motivational interviewing in an attempt to reduce dropout risk. Although Szafranski et al. reported a number of clinically relevant findings, it also had a number of limitations. For instance, the study only examined group means and did not examine possible variations in PTSD symptom change among noncompleters. Moreover, participants in this study were Operation Enduring Freedom and Operation Iraqi Freedom male Veteran inpatients and results may not generalize to populations such as civilian women or to outpatient settings. Similarly, among combat Veterans, Tuerk et al. (2013) found that on average, participants who dropped out of outpatient PE treatment for combat related PTSD had significantly less PTSD symptom reduction when compared to treatment completers. Once again, group means were used at posttreatment and variations in symptom change among dropouts was not reported. Moreover, generalizability to civilian populations and non-combat related index traumas is limited.

Interestingly, in an examination of variable session length CPT among male and female civilians diagnosed with PTSD, Galovski

et al. (2012) found that 58% of treatment completers reached good end-state criteria (i.e., PTSD and depression symptoms fell below a predetermined cutoff) prior to session 12 of the protocol, resulting in early treatment termination. As a result, these individuals were considered early responders and not dropouts. This finding suggests that a substantial portion of individuals do not need full treatment protocols and it is possible that a portion of dropout is related to actual improvement in PTSD symptomatology (Erbes et al., 2009).

Previous research has used a variety of methods to identify symptom change. Typically, symptom improvement has been defined as scoring below a symptom cutoff (good end-state criteria) or displaying significant reductions in symptomatology (i.e., clinically significant change). Previous studies have implemented good end-state criteria for PTSD (PDS < 21; PSS < 14) and depression (BDI < 19) as a way of signifying readiness for treatment termination and/or no longer meeting significant impairment due to present symptoms (Coffey, Gudmundsdottir, Beck, Palyo, & Miller, 2006; Galovski et al., 2012). However, this method does not capture individuals who have PTSD and/or depression scores above the cutoffs who display significant improvement during the course of treatment.

In studies attempting to examine symptom change from pretreatment, clinically significant change (CSC; Hageman & Arrindell, 1999) is often calculated (Ehlers et al., 2013; Leiner, Kearns, Jackson, Astin, & Rothbaum, 2012; Schnurr & Lunney, 2012). However this method is not without its limitations. For instance, individuals who have high levels of symptomatology may significantly improve during the course of treatment, but may still exhibit clinically relevant levels of symptomatology and impairment. Given the benefits and limitations of each method, this study elected to examine both good end-state and CSC within PTSD treatment dropouts.

The first goal of this study was to examine PTSD and depression symptom change among civilian women who voluntarily terminated PTSD treatment prior to completion. Given that Galovski et al. (2012) found that 58% of participants met good end-state criteria for PTSD and depression prior to session 12, we hypothesized that a substantial proportion of dropouts would display significant PTSD and depression improvement. The second goal of this study was to examine demographic differences between dropouts who responded to treatment versus those who did not. Based on the current literature examining differences between treatment completers and dropouts, it was hypothesized that individuals meeting criteria for CSC recovered/improved and good end-state criteria would be younger in age (Erbes et al., 2009; Kehle-Forbes et al., 2015; Szafranski et al., 2016), married/partnered (Gros et al., 2013) and have higher income (Galovski et al., 2012) when compared to individuals who did not meet CSC recovered/improved or good end-state criteria. The third and final goal of this study was to examine overlap between CSC and end-state criteria findings. Both methods are designed to identify individuals whose symptoms significantly improve during treatment and/or fall below clinical threshold for significant impairment. As a result, it was hypothesized that high concordance rates would be found between the two methods.

2. Methods

2.1. Participants

This study combined participants from two randomized clinical trials assessing PTSD treatment outcomes among civilian women (Resick, Nishith, Weaver, Astin, & Feuer, 2002; Resick et al., 2008). Both studies administer the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990, 1995) for PTSD diagnostic purposes. Participants who did not meet PTSD criteria based on CAPS evaluations

were excluded from both intent-to-treatment (ITT) samples. PTSD self-report measures were not used for diagnostic purposes or to determine inclusion/exclusion criteria and were solely used to track symptom change during the course of treatment. Both CAPS and self-report assessments were based on the DSM-IV criteria. These studies were conducted consecutively and recruited participants from the same location. Finally, previous studies have successfully combined participants from these two RCT's in order to examine various aspects of PTSD treatment (Gutner, Gallagher, Baker, Sloan, & Resick, 2016; Lester, Resick, Young-Xu, & Artz, 2010).

The first study compared PTSD outcomes between CPT, PE and a waitlist control group among 171 female rape victims (Resick et al., 2002). Participants were pre-randomized to begin one of the active treatments at the end of the waitlist condition, which was kept blinded from everyone but the data manager. Once again PTSD measures were administered at pretreatment and on even-numbered sessions. However, depression measures were only administered at pre-treatment and post-treatment. As a result, all depression findings were from participants in the Resick et al. (2008) study. The second study examined the effects of differential components of CPT on PTSD and depression outcomes among 150 female victims of interpersonal violence (Resick et al., 2008). This study administered PTSD and depression measures at pretreatment and on even numbered sessions. The full descriptions of the methods and results of each study are presented elsewhere (Resick et al., 2002; Resick et al., 2008).

After combining intent-to-treat samples from both studies, a total of 321 female participants were eligible for possible inclusion into this study. Participants who initiated treatment and did not complete 100% of the treatment sessions were considered dropouts. A total of 195 participants were excluded because they completed 100% of treatment sessions. An additional 50 participants completed the pretreatment assessment, but never initiated treatment. As a result, these individuals were excluded from the study and considered non-initiators, not treatment dropouts. Given that both studies measured PTSD symptoms at pretreatment and on even numbered sessions, participants must have attended at least two sessions in order for symptom change to be identified. As a result, participants were excluded from this study if they if they dropped out immediately after one session ($n = 23$). Among these 23 individuals, the average age was 30.91 (SD = 10.59). The majority were African American (52.17%), single (90.90%) and a large portion reported a yearly household income below $10,000 (31.58%).

A total of 53 participants met all inclusionary criteria for PTSD analyses. All participants were women who had experienced interpersonal violence. The average age of participants eligible for PTSD analyses was 31.85 (SD = 12.32). The majority of participants were White (52.83%) and single (77.36%). Finally, a number of participants (46.67%) had a yearly household income below $10,000.

Only 27 participants met criteria for depression analyses due to only one study investigating depressive symptoms on a weekly basis. In this subset, the age of participants was 34.92 (SD = 14.05) and with the majority of participants White (59.26%), single (77.78%), and with yearly household incomes below $10,000 (44.00%).

2.2. Measures

2.2.1. Posttraumatic Diagnostic Scale (PDS)

The PDS (Foa, 1995) is a 49-item self-report measure of PTSD symptoms, which included the 17 core symptoms of PTSD. The PDS displays good 2–3 week test-retest reliability ($r = 0.83$) and good convergent validity with the PTSD module of the Structured Clinical Interview for DSM Disorders (Foa, Cashman, Jaycox, & Perry, 1997). The PDS was administered in the Resick et al. (2008) study.

2.2.2. PTSD Symptom Scale (PSS)

The PSS (Foa, Riggs, Dancu, & Rothbaum, 1993) is 17-item measure of PTSD symptoms. Foa et al. (1993) found that the PSS displays adequate 1-month test-retest reliability ($r = 0.74$) and good convergent validity with the Rape Aftermath Symptom Scale. The PSS was administered in Resick et al. (2002).

2.2.3. Beck depression inventory—second edition (BDI–II)

The BDI-II (Beck, Steer, & Brown, 1996) is a 21 item, self-report measure of depressive symptoms and depressogenic cognitions associated with depression, with higher numbers indicating greater severity. The BDI-II displays good 1-week test-retest reliability ($r = 0.73$; Wiebe & Penley, 2005) and good convergent validity with other measures of depression (Krefetz, Steer, Gulab, & Beck, 2002).

2.3. Analytic plan

There were three primary goals of this study, 1) identify what proportion of dropouts display CSC improvement and/or meet good end-state criteria for PTSD and depression symptoms; 2) identify possible demographic differences between dropouts who improved and those who did not and 3) examine concordance between CSC status and end-state criteria status for PTSD and depression. This study implemented two methods of examining symptom change, good end-state criteria and CSC. As a result, analyses were conducted for participants meeting good end-state criteria (BDI < 19; PDS < 21; PSS < 14) as defined by Coffey et al. (2006) and Galovski et al. (2012). A second set of analyses examined CSC based on the recommendations in Hageman & Arrindell (1999). CSC categorizes participants 1) recovered, 2) improved, 3) no-change or 4) deteriorated based on symptom change during treatment. For demographic and patient level comparison analyses, CSC recovered and improved were combined, whereas CSC no-change and deteriorated were combined, creating a dichotomous CSC variable (recovered/improved or no-change/deteriorated). This was done in order to keep analytic procedures consistent when examining good end-state and CSC. Moreover, this method is consistent with previous studies that have dichotomized CSC categories during analytic procedures (Anderson & Lambert, 2001). Cohen's d and odds ratios were calculated in order to examine the relationship between participant characteristics (e.g., age) and symptom change for both CSC and end-state criteria. Small ($d = 0.20$; $OR = 1.50$), medium ($d = 0.50$; $OR = 2.50$) and large ($d = 0.80$; $OR = 4.30$) effect sizes were used to describe the strength of the relationship between participant characteristics and symptom change.

3. Results

3.1. PTSD symptom change

An examination of PTSD symptom change revealed that a sizable portion ($n = 20$; 37.74%) of participants met criteria for CSC recovered/improved. The distributions across each of the four CSC categories varied, because the majority of participants met CSC criteria for no-change ($n = 28$; 52.83%), followed by CSC-recovered ($n = 15$; 28.30%), CSC-improved ($n = 5$; 9.43%) and CSC-deteriorated ($n = 5$; 9.43%). Similar findings were noted when examining PTSD good end-state criteria, as 19 (35.85%) participants met PTSD good end-state criteria (PDS < 21; PSS < 14) prior to dropping out of treatment.

A closer investigation of overlap between PTSD CSC recovered/improved status and end-state criteria status revealed high

Table 1
CSC Means and Standard Deviations for Final PTSD and Depression Scores.

Outcome − M (SD)	CSC-Recovered PDS: n = 9 (33.33%) PSS: n = 6 (23.08%) BDI: n = 5 (18.52%)	CSC-Improved PDS: n = 3 (11.11%) PSS: n = 2 (7.69%) BDI: n = 10 (37.04%)	CSC-No change PDS: n = 10 (37.04%) PSS: n = 18 (69.23%) BDI: n = 6 (22.22%)	CSC-Deteriorated PDS: n = 5 (18.52%) PSS: n = 0 (0%) BDI: n = 6 (22.22%)
PDS-Total Severity	9.11 (5.90)	22.00 (3.46)	29.20 (7.61)	41.60 (5.98)
Reexperiencing	2.89 (2.32)	6.67 (1.16)	7.10 (3.88)	11.20 (3.56)
Avoidance	3.33 (3.04)	7.33 (4.16)	12.60 (3.60)	18.20 (2.28)
Arousal	3.33 (2.12)	8.00 (2.00)	9.50 (2.59)	12.20 (2.28)
PSS-Total Severity	8.67 (3.08)	21.50 (4.95)	28.06 (11.35)	
Reexperiencing	1.33 (1.21)	5.50 (4.95)	7.00 (4.34)	
Avoidance	3.83 (1.60)	8.50 (0.71)	12.17 (4.25)	
Arousal	3.50 (1.38)	7.50 (0.71)	8.89 (4.04)	
BDI-II	2.20 (3.83)	21.70 (5.68)	26.50 (12.24)	39.83 (13.47)

Note: PDS = Posttraumatic Diagnostic Scale; PSS = PTSD Symptom Scale; BDI-II = Beck Depression Inventory – Second Edition.

Table 2
End-State Means and Standard Deviations for Final PTSD and Depression scores.

Outcome – M (SD)	Met Good End-State Criteria	
	Yes PDS: n = 12 (44.44%) PSS: n = 7 (26.92%) BDI: n = 10 (37.04%)	No PDS: n = 15 (55.56%) PSS: n = 19 (73.08%) BDI: n = 17 (62.96%)
PDS-Total Severity	11.25 (6.58)	34.20 (7.59)
Reexperiencing	3.58 (2.35)	8.67 (4.05)
Avoidance	3.75 (2.73)	14.93 (3.33)
Arousal	4.25 (2.90)	10.60 (2.23)
PSS-Total Severity	7.71 (3.77)	28.74 (9.46)
Reexperiencing	1.14 (1.22)	7.21 (4.08)
Avoidance	3.43 (1.81)	12.37 (3.40)
Arousal	3.14 (1.57)	9.16 (3.48)
BDI-II	8.40 (7.29)	31.88 (11.20)

Note: PDS = Posttraumatic Diagnostic Scale; PSS = PTSD Symptom Scale; BDI-II = Beck Depression Inventory – Second Edition.

rates of concordance. A total of 17 participants met criteria for both PTSD CSC recovered/improved and PTSD good end-state criteria. Three participants met CSC criteria for improved, but did not meet PTSD good end-state criteria. Two participants met good end-state criteria for PTSD, but did not meet CSC criteria for recovered or improved. Both of these participants' PTSD scores were below good end-state criteria at pretreatment.

3.2. Depression symptom change

Similar to the PTSD findings, 15 (55.56%) participants met depression CSC criteria for recovered/improved. However, distributions across CSC categories differed from those noted in PTSD findings. CSC-improved (n = 10; 37.04%) accounted for the most participants, followed by CSC-no-change (n = 6; 22.22%), CSC-deteriorated (n = 6; 22.22%) and CSC-recovered (n = 5; 18.52%). A total of 10 (37.04%) participants met depression good end-state criteria (BDI < 19) prior to dropping out of treatment.

In contrast to PTSD findings, an investigation of overlap between depression CSC recovered/improved and good end-state criteria revealed low rates of concordance, because only eight participants met criteria for both. A total of seven participants met CSC criteria for improved/recovered but did not meet depression good end-state criteria. Two participants met good end-state criteria for depression, but did not meet criteria for depression CSC improved/recovered status. Similar to PTSD findings, both of these participants reported BDI-II scores well below good end-state criteria levels at pretreatment. Further PTSD and depression symptom breakdown for CSC and end-state categories can be found in Tables 1 and 2.

3.3. CSC categorical comparisons

PTSD and Depression CSC categorical comparisons can be found in Table 3. Bivariate analyses and effect sizes were calculated in order to assess for possible demographic differences between PTSD CSC recovered/improved and CSC criteria no-change/deteriorated groups. Medium-to-large effect sizes were noted for age and number of sessions attended prior to dropout. Participants in the PTSD CSC recovered/improved group were younger in age and attended more treatment sessions than participants in the CSC no-change/deteriorated group. Small effect sizes were noted for years of education completed, months since assault, race, relationship status and household income. Participants in the PTSD CSC recovered/improved group reported more years of completed education, more months since the assault, were more likely to be White, more likely to be married/partnered and higher household income compared to the PTSD CSC no-change/deteriorated group.

When examining differences between depression CSC recovered/improved and CSC no-change/deteriorated groups, large effect sizes were noted for relationship status and number of sessions attended prior to dropout. Participants in the depression CSC recovered/improved group were more likely to be married/partnered and attended more treatment sessions than participants in the depression CSC no-change/deteriorated group. Small effect sizes were noted for age, years of education completed, months since assault, race, and household income. Participants in the depression CSC recovered/improved group were younger in age, reported fewer years of education, more months since assault, were more likely to be White, and had higher household income when compared to the depression CSC no-change/deteriorated group.

3.4. End-state categorical comparisons

PTSD and depression end-state categorical comparisons can be found in Table 4. Once again, bivariate analyses and effect sizes were calculated in order to assess for possible demographic differences between participants below and above PTSD good end-state criteria. Large effect size was noted for number of sessions attended prior to dropout. Participants who met PTSD good end-state criteria attended more sessions than participants who did not meet good end-state criteria. Small-medium effect sizes were noted for age, years of education completed, months since assault, race, relationship status and household income. Participants who met PTSD good end-state criteria were younger in age, reported more years of completed education, more months since the assault, were less likely to be White, were more likely to be married/partnered, and reported higher household income compared to participants who did not meet PTSD good end-state criteria.

Table 3
CSC Demographic Comparisons.

Outcomes	PTSD CSC Criteria			Depression CSC Criteria		
	Recovered or Improved (n = 20; 37.74%)	No-change or Deteriorated (n = 33; 62.26%)	d/OR (95% CI)	Recovered or Improved (n = 15; 55.56%)	No-change or Deteriorated (n = 12; 44.44%)	d/OR (95% CI)
Age – M (SD)	27.47 (8.84)	34.36 (12.78)	−0.60 (−1.17: −0.02)	33.14 (11.79)	37.00 (17.09)	−0.27 (−1.05: 0.50)
Years of Education – M (SD)	13.78 (1.78)	13.42 (2.20)	0.18 (−0.39: 0.73)	13.30 (2.45)	13.33 (1.97)	0.01 (−0.77: 0.74)
Months Since Assault – M (SD)	122.63 (136.77)	121.11 (127.00)	0.01 (−0.54: 0.57)	165.22 (153.27)	149.92 (148.76)	0.10 (−0.65: 0.86)
Race			1.15 (0.38: 3.51)			0.57 (0.12: 2.75)
White – n (%)	11 (20.75)	17 (32.08)		8 (29.63)	8 (29.63)	
Non-White – n (%)	9 (16.98)	16 (30.19)		7 (25.93)	4 (14.81)	
Relationship Status			1.24 (0.33: 4.60)			5.50 (0.55: 55.49)
Married/Partnered – n (%)	5 (9.43)	7 (13.21)		5 (18.52)	1 (3.70)	
Single – n (%)	15 (28.30)	26 (49.06)		10 (37.04)	11 (40.74)	
Household Income			1.69 (0.50: 5.68)			2.10 (0.43: 10.85)
≤$10,000 – n (%)	7 (15.56)	14 (31.11)		5 (20.00)	6 (24.00)	
>$10,000 – n (%)	11 (24.44)	13 (28.89)		9 (36.00)	5 (20.00)	
Number of Tx Sessions – M (SD)	6.00 (2.87)	3.88 (1.95)	0.91 (0.33: 1.49)	6.13 (3.04)	3.58 (1.44)	1.03 (0.22: 1.84)

Table 4
End-State Demographic Comparisons.

Outcomes	Met PTSD Good End-State Criteria (PDS < 21; PSS < 14)			Met Depression Good End-State Criteria (BDI < 19)		
	Yes (n = 19; 35.85%)	No (n = 34; 64.15%)	d/OR (95% CI)	Yes (n = 10; 37.04%)	No (n = 17; 62.96%)	d/OR (95% CI)
Age – M (SD)	29.47 (11.59)	33.21 (12.02)	−0.32 (−0.88: 0.25)	38.50 (13.85)	32.69 (14.14)	0.41 (−0.38: 1.21)
Years of Education – M (SD)	13.66 (1.75)	13.50 (2.22)	0.08 (−0.49: 0.64)	13.10 (2.03)	13.44 (2.36)	−0.15 (−0.93: 0.63)
Months since assault – M (SD)	130.16 (148.06)	116.95 (119.95)	0.10 (−0.46: 0.66)	188.14 (182.93)	140.93 (127.14)	0.32 (−0.47: 1.10)
Race			0.99 (0.32: 3.04)			0.55 (0.11: 2.67)
White – n (%)	10 (18.87)	18 (33.96)		5 (18.52)	11 (40.74)	
Non-White – n (%)	9 (16.98)	16 (30.19)		5 (18.52)	6 (22.22)	
Relationship Status			1.38 (0.37: 5.14)			2.00 (0.32: 12.59)
Married/Partnered – n (%)	5 (9.43)	7 (13.21)		3 (11.11)	3 (11.11)	
Single – n (%)	14 (26.42)	27 (50.94)		7 (19.05)	14 (25.93)	
Household Income			1.69 (0.50: 5.68)			4.50 (0.70: 28.79)
≤$10,000 – n (%)	7 (15.56)	14 (31.11)		2 (8.00)	9 (36.00)	
>$10,000 – n (%)	11 (24.44)	13 (28.89)		7 (28.00)	7 (28.00)	
Number of Tx Sessions – M (SD)	5.95 (2.95)	3.97 (1.98)	0.84 (0.25: 1.42)	6.50 (2.80)	4.12 (2.37)	0.94 (0.12: 1.76)

When examining differences between participants below and above depression good end-state criteria, large effect sizes were noted for household income and number of sessions attended prior to dropout. Participants who met depression good end-state criteria reported higher household income and attended more treatment sessions than participants who did not meet depression good end-state criteria. Small-medium effect sizes were noted for age, years of education completed, months since assault, race and relationship status. Participants who met depression good end-state criteria were older in age, reported less years of completed education, reported greater number of months since assault, and were less likely to be White, were more likely to be married/partnered compared to participants who did not meet depression good end-state criteria.

4. Discussion

The lack of consistency (e.g., definition, rates, and implications) within the current dropout literature (Erbes et al., 2009; Garcia et al., 2011; Gros et al., 2013; Tuerk et al., 2013) leads to basic but important questions including, how do we define dropout, how do we measure symptom improvement among dropouts, and is dropout necessarily a negative event? This study attempted to address some of those questions, and was the first to examine PTSD and depression symptom change among female civilians who dropped out of PTSD treatment. However, given the relatively small sample size examined in this study, results and suggestions should be interpreted with caution.

There were three sets of findings based on primary goals. First, a significant proportion of dropout participants (35–55%) displayed clinically significant improvement and/or met good end-state criteria for PTSD or depression. Second, demographic differences were found when comparing CSC groups, as well as end-state groups for both PTSD and depression. Third, high rates of overlap were noted between PTSD CSC recovered/improved status and PTSD good end-state criteria status; however, this was not the case when examining overlap between depression CSC recovered/improved and depression good end-state criteria status. Together, these findings highlight the need for a consistent, useful operational definition of treatment dropout, alterations in common research methods in order to track symptom change among dropouts and study differences between treatment responders and non-responders among individuals who do not complete full treatment protocols.

A widely held belief among researchers and clinicians is that individuals who drop out of PTSD treatment do not improve (Szafranski et al., 2014; Tuerk et al., 2013). The results of this study provide evidence to the contrary and suggest that signif-

icant proportions of dropouts display significant reductions in PTSD and depression symptomatology. This finding was consistent with our hypothesis and with previous researcher hypotheses about why different rates of dropout are noted among subsets of participants (Erbes et al., 2009). These findings have important implications. Many treatment outcome studies examine symptoms at pretreatment-posttreatment time-points and define dropout as individuals not completing full treatment protocols (Chard, Schumm, McIlvain, Bailey, & Parkinson, 2011; Erbes et al., 2009; Teng et al., 2008). These methodological issues likely lead to large subsets of individuals being considered dropouts, despite improving during the course of treatment. In contrast, effectiveness studies in clinical research settings demonstrate much variability in session length in PTSD treatments (Gros et al., 2011; Yoder et al., 2012).

The present findings suggest that individuals who drop out of treatment and display significant gains as defined by CSC criteria and/or meet established symptomatology good end-state criteria should not be considered dropouts, but would be better defined as early treatment responders. In order to reduce these methodological problems and to better track symptom change among individuals not completing full treatment protocols, researchers may consider regularly administering brief measures of PTSD and depression throughout the course of treatment (Galovski et al., 2012; Resick et al., 2002; Resick et al., 2008). Although this is done regularly in many studies with more complex modeling, these data could be used to inform and determine the course of treatment, including successful completion of treatment prior to the predetermined final session of the protocol. As noted in recent research, it is also possible that early responders who choose to complete the full protocol despite early gains, may display even greater symptom reduction (Clapp, Kemp, Cox, & Tuerk, 2016). Finally, early treatment responders should be followed post-treatment by clinicians to ensure gains maintain and symptoms do not return to baseline.

Clinicians may also consider the same suggestion regarding the classification of dropout, because subsets of patients (Erbes et al., 2009) likely improve faster than others and may not need full treatment protocols (Galovski et al., 2012). Obtaining regular structured feedback about symptom change would likely aid clinicians' ability to identify patients who do not need full treatment protocols, reduce dropout rates and may improve access to mental healthcare/reduce waitlists by eliminating superfluous treatment sessions. Although this may be occurring in some settings as noted above (Gros et al., 2011; Yoder et al., 2012), newer large-scale dissemination efforts need to incorporate these recommendations as well (Ruzek, Karlin, & Ziess, 2012). Finally, by implementing these suggestions, it may help operationalize the definition of dropout within naturalistic settings, lead to more consistent findings within the literature and provide more clinically useful findings.

Another goal of this study was to examine demographic differences between dropouts who responded to treatment and those who did not. Findings revealed that participants meeting criteria for PTSD CSC recovered/improved and/or PTSD good end-state criteria were younger in age than individuals who did not meet criteria for these groups. This finding related to age is particularly interesting given that research has regularly identified younger age as a strong predictor of dropout, but has often been interpreted as a negative event/risk factor (Erbes et al., 2009; Garcia et al., 2011; Yoder et al., 2012). It is possible that learned maladaptive coping behaviors (e.g., avoidance and escape behaviors) and cognitions (e.g., catastrophic cognitions) were less engrained in younger participants due to a shorter learning history, allowing for more cognitive flexibility and quicker alterations during treatment. As a result, younger age may actually be a predictor of early treatment response, rather than negatively-construed dropout.

Individuals who recovered/improved and/or met good end-state criteria attended more treatment sessions on average than those that did not respond to treatment. This finding, which was consistent across PTSD and depression analyses, is consistent with Galovski et al. (2012) and indicates that, while full treatment protocols may not be needed for some individuals, there does seem to be a minimum session attendance (e.g., 6 sessions) in order to obtain significant symptom reduction. At what level session threshold lies is still uncertain and further studies similar to that of Galovski et al. are needed in order to elucidate this question. However, very early dropouts are probably truly dropping out of treatment and avoiding facing their traumatic events.

Differences in relationship status and income (Galovski et al., 2012) were also found when examining depression change. Although directionality of these findings was consistent across PTSD and depression analyses, effect sizes were much larger within depression categories. It is possible that having a significant other and higher household income allow for greater access to enjoyable activities/interactions, thus influencing depression symptoms more than PTSD symptoms. Further research is needed to further clarify the relationship and interaction effects between these factors.

A common question within the dropout literature is: How do we accurately measure symptom change (Erbes et al., 2009)? This study examined symptom change/improvement by implementing two common methods noted in treatment outcome literature, 1) CSC and 2) good end-state criteria (Coffey et al., 2006; Ehlers et al., 2013). It was hypothesized that there would be significant overlap when comparing CSC and good end-state criteria outcomes, which was only partially supported by the results. Within PTSD analyses, the vast majority of participants who met PTSD CSC recovered/improved criteria also met PTSD good end-state criteria. This was not the case when examining overlap between depression CSC and good end-state criteria outcomes. It is possible that the differential findings are due to the small sample size used in depression analyses and the fact that only half of the participants in the study had depression at baseline (floor effects). Further research examining overlap between these two methods is needed to better understand these differential findings. Given the large amount of overlap in PTSD findings between CSC and good end-state criteria, these authors suggest researchers and clinicians implement either CSC or good end-state criteria to better identify participant dropout or patient readiness for treatment termination. Moreover, clinicians may find it useful to discuss patients' status with regard to CSC or good end-state criteria when collaborating with patients about treatment plans during the course of psychotherapy (Zoellner, Feeny, Cochran, & Pruitt, 2003).

There were several limitations in this study. First, this study consisted of only female civilians diagnosed with PTSD and findings may not generalize to other populations including males or Veterans. Second, this study consisted of data from two randomized clinical trials. It is possible that these findings may not generalize to more naturalistic clinical settings. Third, this study consisted of a relatively small sample size, which may have underpowered analyses for detecting differences, especially for depression analyses. Assessments were administered on even numbered sessions and symptom changes between even and odd numbered sessions were not captured, meaning that participants' data from those who dropped out on an odd number session were a week old. Moreover, this resulted in 23 participants who attended one session of treatment being excluded from analyses. It is unlikely participants displayed significant decreases after only one session, which may have inflated the total percentage of early responders. As a result, findings should be interpreted with caution. Future studies should include larger, more diverse sample sizes from a variety of clinical settings and administer brief symptom measures prior to each session.

In summary, the present study investigated the symptom change among PTSD treatment dropouts. Although preliminary, the findings are the first to identify subsets of dropouts who display significant improvement in PTSD and depression symptoms. Notable demographic differences were found between participants who improved compared to those who did not. These findings highlight the need for researchers and clinicians to consistently implement and operationally define dropout, regularly track symptom change during the course of treatment, and implore multiple methods of assessing symptom change and/or readiness for treatment termination. These changes may lead to more consistent dropout estimates, and improve communication between clinicians and patients.

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