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Do Scores on the Beck Depression Inventory-II Predict Outcome in Cognitive Processing Therapy?

Octaviana Hemmy Asamsama, Benjamin D. Dickstein, and Kathleen M. Chard

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Octaviana Hemmy Asamsama
Cincinnati VA Medical Center, Cincinnati, Ohio, and Loma Linda University

Benjamin D. Dickstein
Cincinnati VA Medical Center, Cincinnati, Ohio

Kathleen M. Chard
Cincinnati VA Medical Center, Cincinnati, Ohio, and University of Cincinnati School of Medicine

Current treatment guidelines for posttraumatic stress disorder (PTSD) recognize that severe depression may limit the effectiveness of trauma-focused interventions, making it necessary to address depression symptomatology first. However, there is a paucity of research providing specific treatment recommendations using a common depression measure like the Beck Depression Inventory-II (BDI-II). Accordingly, we examined the utility of using BDI-II cutoff scores for predicting response to cognitive processing therapy (CPT). Our sample was 757 military veterans receiving outpatient therapy at a Department of Veterans Affairs specialty clinic. At baseline, the majority of participants (58.9%) reported BDI-II scores suggestive of severe depression, and 459 (60.7%) met *DSM–IV* diagnostic criteria for major depressive disorder (MDD). Despite this high level of depression severity, most participants who completed therapy experienced a clinically significant reduction in symptoms (75.1%). No differences were observed across BDI-II groups on rates of clinically significant change in PTSD symptoms or on rates of treatment completion. Taken together, results suggest that CPT is an effective treatment, even in cases of severe co-occurring depression. Limitations and implications for treatment guidelines are discussed.

Keywords: BDI-II, CPT, PTSD, depression, trauma

Individuals with posttraumatic stress disorder (PTSD) are more likely to have a comorbid depressive episode and are at increased risk for major depressive disorder (MDD) relative to the general population (Davidson, Hughes, Blazer, & George, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Rates of co-occurring PTSD and depression range markedly depending on the population under study but appear especially high in military veterans (Ikin, Creamer, Sim, & McKenzie, 2010; Kessler et al., 1995). In a recent study of soldiers returning from Operations Iraqi and Enduring Freedom (OIF/OEF), 24% of participants had PTSD and clinically significant depressive symptoms (Lapierre, Schwegler, & LaBauve, 2007).

Given the high prevalence of co-occurring PTSD and depression, clinicians are often faced with the difficult task of choosing between available treatment options. Current treatment guidelines for PTSD recommend that clinicians use approaches impacting PTSD and depression symptoms concurrently (i.e., evidence-based, trauma-focused interventions); however, these guidelines acknowledge that severe depression may limit the effectiveness of trauma-focused interventions, making it necessary to address depression symptomatology first (Foa, Keane, Friedman, & Cohen, 2009).

Indeed, some research suggests that high levels of depression increase risk for nonresponse to PTSD treatment, as well as premature termination. For instance, Stein, Dickstein, Schuster, Litz, and Resick (2012) found that female interpersonal violence survivors with diagnoses of PTSD and MDD were three times less likely to respond to cognitive processing therapy (CPT) and its dismantled components compared with those without elevated depression symptoms. Additionally, in a study of 58 civilian trauma survivors with mixed trauma histories, Bryant, Moulds, Guthrie, Dang, and Nixon (2003) found that participants with severe depression were less likely to complete cognitive–behavioral therapy for PTSD.

Contrary to these studies, however, Lloyd et al. (2014) found no association between self-reported depression symptoms and response to CPT in a sample of Australian military veterans. Similarly, in a sample of mixed trauma patients, van Minnen, Arntz, and Keijers (2002) found that baseline depression did not predict

treatment outcome or retention in prolonged exposure therapy for PTSD. Lastly, Walter, Barnes, and Chard (2012) found no association between MDD diagnostic status and treatment outcome in veterans completing a VA residential program for PTSD and traumatic brain injury.

Given the inconsistent findings, it is difficult for clinicians to know if, or when, depression symptoms diminish the effectiveness of trauma-focused therapy. For instance, it is possible that only severe depression undermines PTSD treatment. Adding to this uncertainty, there has yet to be research examining if cut scores on common depression measures like the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) predict treatment engagement and response. For clinicians, findings regarding specific cutoffs would likely be more applicable than those involving regression-derived coefficients. Accordingly, the aim of this study was to test whether cutoffs on the BDI-II are predictive of treatment engagement and response in a sample of military veterans receiving outpatient CPT.

Method

Participants and Procedure

Participants were military veterans receiving outpatient CPT at a Midwestern Veterans Affairs PTSD specialty clinic between 2005 and 2013. Per clinic policy, data were collected throughout treatment as part of routine clinical care. The local Institutional Review Board and the local VA Research and Development office issued a waiver of written consent and approved use of these data for purposes of archival analysis.

All participants met diagnostic criteria for PTSD as measured by the Clinician Administered PTSD Checklist for *DSM–IV* (CAPS; Blake et al., 1995). In addition, all participants received at least one session of CPT (Resick, Monson, & Chard, 2007), a leading evidence-based PTSD treatment. Veterans reporting acute suicidal or homicidal thoughts, active psychosis, or unmanaged bipolar symptoms were asked to address these needs before starting treatment. Treating clinicians consisted of licensed mental health workers (nurse practitioners, social workers, psychiatrists, and psychologists) or supervised trainees (practicum students, interns, and residents). Diagnostic interviews were conducted by a provider other than the treating clinician. Because data were collected during routine care, sessions were not audio recorded and examination of treatment fidelity and interrater reliability is not possible.

The study sample consisted of 665 males (87.8%) and 92 females (12.2%). Mean age was 43.86 years (*SD* = 14.69) and mean education was 13.23 years (*SD* = 1.85). Most participants were White (*n* = 609; 80.7%), married (*n* = 371; 49.0%) or divorced (*n* = 194; 25.6%), employed full-time (*n* = 261; 36.5%) or unemployed (*n* = 192; 26.9%), and of OIF/OEF (*n* = 308; 40.7%) or Vietnam (*n* = 245; 32.4%) service era. In addition, most (*n* = 515; 68.3%) identified combat as their index trauma. At baseline, 459 (60.7%) met *DSM–IV* diagnostic criteria for current MDD.

Measures

Structured diagnostic interviews were used to diagnose PTSD and MDD. Respectively, the CAPS (Blake et al., 1995) and the Structured Clinical Interview for *DSM–IV* Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996) were used for this purpose. The CAPS and SCID-I are well used and validated instruments and both are considered gold standard assessment measures (e.g., Lobbestael, Leurgans, & Arntz, 2011; Shear et al., 2000; Weathers, Keane, & Davidson, 2001; Wilson & Keane, 2004.

Self-reported depression and PTSD symptomatology were assessed using the BDI-II (Beck, Steer, & Brown, 1996) and the PTSD Checklist–Specific Version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993), respectively. Both measures have been extensively validated and are commonly used by clinicians and researchers (e.g., Richter, Werner, Heerlein, Kraus, & Sauer, 1998; Wilkins, Lang, & Norman, 2011). The BDI-II contains 21 items and has a score range of 0–63. As recommended by Beck, Steer, and Brown (1996), scores ranging from 0–13 are suggestive of minimal depression; 14–19 of mild depression; 20–28 of moderate depression; and 29–63 of severe depression. The BDI-II was administered at pretreatment. The PCL-S contains 17 items and has a score range of 17–85. It was administered periodically throughout therapy and was used as the primary study outcome. A 10-point decrease on the PCL-S has been shown to represent clinically significant change (Monson et al., 2006). Clinically significant improvement was operationalized accordingly.

Data Analysis

Statistical analysis was performed using PASW Statistics Version 20 (IBM SPSS, 2011). Descriptive statistics are reported for all measures. Baseline differences between BDI-II categories were analyzed using χ^2 tests. Per Monson et al. (2006), clinically significant change was determined by a change score of 10 or greater on the PCL-S (participants' last completed PCL-S was compared with their baseline score). On average, participants, completed the PCL-S at 6.02 (*SD* = 4.83) time points. Treatment dropout was determined by (a) completing fewer than 12 CPT sessions, and (b) lacking clinically significant change on the PCL-S. Dropout was operationalized in this manner to account for possible early treatment responders (i.e., individuals discontinuing therapy due to satisfaction with obtained level of response) and provide a more conservative estimate of treatment dropout. Because there was only a minimal amount of missing data on the variables of interest, pairwise deletion was employed.

Results

Baseline BDI-II scores ranged from 2–59 with a mean of 31.34 (*SD* = 10.91). Most participants (58.9%) reported a score suggestive of severe depression. Cutoffs were tested in three ways: standard BDI-II categories (0–13, 14–19, 20–28, 29–63); 10-point intervals; and 5-point intervals in the severe depression range (29–63). Chi-square tests suggested that treatment completion did not differ as a function of BDI-II score classification (see Table 1). Surprisingly, a similar rate of premature dropout was observed in the severely depressed group (40.36%) and overall sample (40.55%). A secondary, logistic regression analysis was performed to further examine the relationship between depression severity and dropout; results were nonsignificant (β = .002, *SE* = .007, *p* = .755).

Table 1
Baseline BDI-II Scores, Early Treatment Dropout, and Significant Change on the PCL-S

	Dropout		Change	
	No	Yes	No	Yes
BDI-II Score n (%)	450 (59.45)	307 (40.55)	419 (55.35)	338 (44.65)
Suggested cut-off				
0–13	24 (58.54)	17 (41.56)	26 (63.41)	15 (36.59)
14–19	42 (58.33)	30 (41.67)	41 (56.94)	31 (43.06)
20–28	118 (59.60)	80 (40.40)	111 (56.06)	87 (43.94)
29–63	266 (59.64)	180 (40.36)	241 (54.04)	205 (45.96)
10-point interval				
0–9	7 (56.85)	6 (46.15)	9 (69.23)	4 (30.77)
10–19	59 (59.00)	41 (41.00)	58 (58.00)	42 (42.00)
20–29	130 (59.63)	88 (40.37)	122 (55.96)	96 (44.04)
30–39	144 (60.25)	95 (39.75)	126 (52.72)	113 (47.28)
40–49	92 (60.93)	59 (39.07)	81 (53.64)	70 (46.36)
50–63	18 (50.00)	18 (50.00)	23 (63.89)	13 (36.11)
Severe depression	266 (59.64)	180 (40.36)	241 (54.04)	205 (45.96)
29–34	88 (59.46)	60 (40.54)	75 (50.68)	73 (49.32)
35–39	68 (61.26)	43 (38.74)	62 (55.86)	49 (44.14)
40–44	66 (66.67)	33 (33.33)	50 (50.51)	49 (49.49)
45–49	26 (50.00)	26 (50.00)	31 (59.62)	21 (40.38)
50–63	18 (50.00)	18 (50.00)	23 (63.89)	13 (36.11)

Note. Between group comparisons were made using χ^2 tests. No significant differences were found. BDI-II = Beck Depression Inventory-II; PCL-S = PTSD Checklist–Specific Version. Dropout refers to premature termination from CPT, and change refers to a clinically significant reduction in self-reported PTSD symptoms.

With regard to clinically significant symptom change (as determined by a 10-point decrease on the PCL), chi-square tests suggested no significant between-groups differences as a function of BDI-II classification (see Table 1). A similar rate of clinically significant change was observed in the severely depressed group (45.96%) and overall sample (44.65%). A secondary, logistic regression analysis was performed to further examine the relationship between baseline depression and clinically significant change in PTSD symptoms; results were nonsignificant (β = .001, SE = .007, p = .864).

Lastly, to determine whether depression severity impacted treatment response among CPT completers, an additional chi-square analysis was performed using the same BDI-II classification groups. Results indicated that response to a full course of CPT did not differ as a function of BDI-II classification (see Table 2). Logistic regression again revealed a nonsignificant relationship between depression severity and treatment response (β = .006, SE = .010, p = .540). Interestingly, a majority (77.07%) of veterans whose BDI-II scores were suggestive of severe depression (BDI-II $\geq$ 29) experienced a clinically significant decrease in PTSD following a complete course of CPT.

Discussion

We examined the utility of the BDI-II for informing treatment selection in veterans with co-occurring PTSD and depression. Specifically, we grouped participants receiving CPT according to baseline BDI-II score and compared them on rates of treatment completion and clinically significant response. Results indicate that baseline BDI-II classifications could not determine who was more likely to terminate therapy prematurely or experience limited symptom change. Secondary analysis, using continuous data, fur-

ther indicated that BDI-II scores were not predictive of dropout or treatment response. It thus appears that depressive symptoms did not prevent participants from engaging in or benefiting from CPT.

These findings are somewhat surprising given that previous studies identified a link between depression and the outcomes of interest (Bryant, Moulds, Guthrie, Dang, & Nixon, 2003; Stein, Dickstein, Schuster, Litz, and Resick, 2012). However, they are consistent with past research that has failed to find a relationship between depression and response to trauma-focused treatments (van Minnen et al., 2002), especially CPT (Lloyd et al., 2014; Walter, Barnes, & Chard, 2012). It may be that the CPT protocol is particularly well-suited to addressing co-occurring PTSD and depression given that cognitive reappraisal is a prominent component not only of CPT but of cognitive-behavior treatments for mood disorders (Beck, Rush, Shaw, & Emery, 1979). Alternatively, individuals with higher levels of depression may be more motivated to seek relief from PTSD symptoms.

With regard to treatment implications, it does not appear that high levels of self-reported depression are reason to defer trauma-focused psychotherapy, that is, CPT, assuming an individual with co-occurring PTSD and depression is otherwise motivated and appropriate for treatment. This is particularly important in light of the high prevalence of severe depression observed in military veterans. Indeed, a majority of participants in our study (58.9%) were classified as severely depressed at treatment outset. However, among those who completed therapy, over three quarters of severely depressed participants experienced a significant drop in symptoms. Even individuals with the highest levels of depression (BDI-II scores of 50 or higher) reported similar rates of response (72.2%), assuming CPT completion.

Table 2

Baseline BDI-II Scores of Treatment Completers and Significant Change on the PCL-S

	Change	
	No	Yes
BDI-II Score *n* (%)	112 (24.89)	338 (75.11)
Suggested cut-off		
0–13	9 (37.50)	15 (62.50)
14–19	11 (26.19)	31 (73.81)
20–28	31 (26.27)	87 (73.73)
29–63	61 (22.93)	205 (77.07)
10-point interval		
0–9	3 (42.86)	4 (57.14)
10–19	17 (28.81)	42 (71.19)
20–29	34 (26.15)	96 (73.85)
30–39	31 (21.53)	113 (78.47)
40–49	22 (23.91)	70 (76.09)
50–63	5 (27.78)	13 (72.22)
Severe depression	61 (22.93)	205 (77.07)
29–34	15 (17.05)	73 (82.95)
35–39	19 (27.94)	49 (72.06)
40–44	17 (25.76)	49 (74.24)
45–49	5 (19.23)	21 (80.77)
50–63	5 (27.78)	13 (72.22)

Note. Between group comparisons were made using χ^2 tests. No significant differences were found. BDI-II = Beck Depression Inventory-II; PCL-S = PTSD Checklist–Specific Version. Change refers to a clinically significant reduction in self-reported PTSD symptoms.

Findings from this study should be interpreted in light of several limitations. First, all participants received a specialized trauma-focused treatment; it is unclear if severe depression limits response to other forms of trauma-focused therapy. Similarly, although our sample was mostly unrestricted and likely representative of veterans seeking outpatient PTSD treatment, our sample was not stratified, which may impact generalizability. Second, although a 10-point decrease on the PCL has been shown to be a reliable indicator of clinically significant change, veterans reporting lower levels of baseline symptoms may have been less likely to experience a 10-point decrease due to floor effects, and missing PCL data may have caused some cases of clinically significant change to go undetected. Lastly, qualitative data regarding participants' reasons for dropout were not collected, precluding a more nuanced examination of this outcome.

Despite these limitations, this study provides important confirming evidence that CPT is an effective and appropriate treatment for veterans with co-occurring PTSD and severe depression. In addition, our results also call attention to the crucial role that retention plays as a prerequisite to treatment response. A relatively high percentage of premature termination (40.6%) was observed in our sample, and a markedly lower rate of clinically significant improvement (44.7%) was found when noncompleters were included in treatment-response analyses. Given that retention appears an important prerequisite for treatment response, future studies should focus on promoting sustained engagement in PTSD therapy. In addition, future studies should examine whether depression measures can effectively identify individuals at increased risk for dropout and treatment nonresponse in other forms of trauma-focused therapy.

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