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An Evaluation of the Effectiveness of Evidence-Based Psychotherapies for Depression to Reduce Suicidal Ideation among Male and Female Veterans



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ABSTRACT

Background: Although most suicide-related deaths occur among male veterans, women veterans are dying by suicide in increasing numbers. Identifying and increasing access to effective treatments is imperative for Department of Veterans Affairs suicide prevention efforts. We examined the impact of evidence-based psychotherapies for depression on suicidal ideation and the role of gender and treatment type in patients' responses to treatment.

Methods: Clinicians receiving case consultation in interpersonal psychotherapy, cognitive-behavioral therapy for depression, and acceptance and commitment therapy for depression submitted data on depressive symptoms and suicidal ideation while treating veterans with depression.

Results: Suicidal ideation was reduced across time in all three treatments. A main effect for wave was associated with statistically significant decreases in severity of suicidal ideation, $\chi^2(2) = 224.01, p = .0001$, and a subsequent test of the Gender \times Wave interaction was associated with differentially larger decreases in ideation among women veterans, $\chi^2(2) = 9.26, p = .001$. Within gender-stratified subsamples, a statistically significant Treatment \times Time interaction was found for male veterans, $\chi^2(4) = 16.82, p = .002$, with levels of ideation significantly decreased at waves 2 and 3 in interpersonal psychotherapy and cognitive-behavioral therapy for depression relative to acceptance and commitment therapy for depression; the Treatment \times Wave interaction within the female subsample was not statistically significant, $\chi^2(4) = 3.41, p = .492$.

Conclusions: This analysis demonstrates the efficacy of each of the three tested evidence-based psychotherapies for depression as a means of decreasing suicidal ideation, especially in women veterans. For male veterans, decreases in suicidal ideation were significantly greater in interpersonal psychotherapy and cognitive-behavioral therapy for depression relative to acceptance and commitment therapy for depression.

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Suicide prevention is a top clinical priority within the Department of Veterans Affairs (VA). In response, the Veterans Health Administration (VHA) has called for expanded access to and engagement in effective treatments to prevent veteran suicide (VA, 2018). The number of veterans dying by suicide in the United States has been increasing, and although the majority of suicide-related decedents among veterans are men, women veterans are dying by suicide in increasing numbers (VA, 2018).

From 1999 through 2014, the suicide rate among women veterans rose by 62.4%, compared with a rate increase of 29.7% among male veterans (VA & Office of Mental Health and Suicide Prevention, 2017), and the rate of suicide for women veterans is twice that of nonveteran adult women (VA, 2018). The risk of suicide among women veterans using VHA services has also increased in recent years, from 14.4 per 100,000 in 2001 to 17.3 per 100,000 in 2014 (VA & Office of Mental Health and Suicide Prevention, 2017). The narrowing of the gender gap in suicide risk and the expanding concurrent risk of death by suicide among women veterans make it imperative that women veterans have access to effective treatments to address these risks.

Despite an extensive body of literature aiming to identify risk factors for suicide, a recent meta-analytic review concluded that existing research does not establish accurate or reliable predictors of suicide and “cannot provide much useful information about treatment and prevention targets,” appealing for improved methodology in suicide research (Franklin et al., 2017). Amidst an ongoing evolution of empirical knowledge, the VA is tasked with addressing increasing rates of suicide among veterans and taking into account the unique contributions of gender.

Depressive disorders are a frequently cited risk factor for suicide (Arsenault-Lapierre, Kim, & Turecki, 2004; Cavanagh, Carson, Sharpe, & Lawrie, 2003; Harris & Barraclough, 1997; Holma et al., 2014; Nock et al., 2009; Nordentoft & Mortensen, 2011) and, hence, provide a potential target for suicide prevention among women veterans. Women are more frequently diagnosed with depressive disorders than are men (Kessler et al., 2003), and the association between depressive disorders and suicide risk is more substantial among women (Arsenault-Lapierre et al., 2004). Frequency of depression is also higher for women than men within the veteran population (Curry, Aubuchon-Endsley, Brancu, Runnals, & Fairbank, 2014; Davis et al., 2016; Maguen et al., 2010; Seal et al., 2009), with one study reporting that 46.5% of women veterans meet criteria for major depressive disorder during their lifetime (Curry et al., 2014). Recurring thoughts of death or suicide are one of the nine symptoms characterizing major depressive disorder (American Psychiatric Association, 2013), highlighting an explicit link between depression and suicide risk. Women have higher lifetime prevalence of suicide ideation (20.1% vs. 12.7%) and twice the rate of lifetime suicide attempts compared with men (5.1% vs. 2.5%), and much of the increased risk of suicide attempts for women may be accounted for by increased ideation (Millner et al., 2017). After examining predictive associations between mental health disorders and risk of death by suicide, Nock et al. (2009) concluded that depression is among the strongest predictors of suicide attempts, owing in large part to depression predicting the onset of suicidal ideation. In contrast, a thorough meta-analysis conducted by Franklin et al. (2017) did not identify internalizing disorders or suicidal ideation as substantial predictors of later suicidal behavior or death by suicide, leaving conclusions about the nature of these relationships unsettled.

The presence of heightened risk of suicide in veterans with depression is recognized in the VA/Department of Defense Clinical Practice Guideline for the Assessment and Management of Patients at Risk of Suicide (VA, 2013), which states, “research suggests that the effective treatment of mental health conditions (particularly major depression) reduces the risk of suicide and may decrease suicide rates.” Further, the VA/Department of Defense Clinical Practice Guideline recommends that “patients receive optimal evidence-based treatment for any mental health and medical conditions that may be related to the risk of suicide.” Among the first-line treatments recommended for major

depressive disorder are evidence-based psychotherapies (EBPs), including cognitive-behavioral therapy for depression (CBT-D), interpersonal psychotherapy (IPT), and acceptance and commitment therapy for depression (ACT-D). CBT-D is a time-limited, structured psychotherapy that encourages behavioral changes that reduce depression, such as increases in pleasurable activities, and guides the patient through restructuring cognitions and beliefs that maintain depression. IPT addresses the relationship between adverse life events and depression by facilitating focus on processing affect related to interpersonal relationships (Markowitz & Weissman, 2012; Sullivan, 1953). ACT-D treats depression by encouraging acceptance of internal experiences and alignment of behavior with intrinsic motivations (Hayes, Levin, Plumb-Villardaga, Vilatte, & Pistorello, 2013). Clinical trials have established the efficacy of CBT-D (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012), IPT (Cuijpers et al., 2011), and ACT-D (Öst, 2014) in reducing depressive symptoms. Within veteran populations, large within-group reductions in depressive symptoms have been observed in VHA clinical effectiveness studies of each intervention (CBT-D: Karlin et al., 2012; IPT: Stewart et al., 2014; and ACT-D: Walser, Karlin, Trockel, Mazina, & Taylor, 2013). Although the efficacy of each of these interventions is established, the role of gender is not (for a review, see Parker, Blanch, & Crawford, 2011). Some studies have demonstrated greater symptom reduction for women (Evans, 2007; Spek, Nyklicek, & Cuijpers, 2008), some report better treatment outcomes in men (Bockting et al., 2006; Thase et al., 1994), and others show equivalence across gender (Jarrett, Grannemann, & Rush, 1991; McEvoy & Nathan, 2007; Scott, 2001; Watson & Nathan, 2008).

Although the effects of EBPs for depression on suicidality have not been explored thoroughly, available evidence suggests that these treatments are effective in reducing suicidal ideation. CBT-D and ACT-D were reported to reduce suicidal ideation specifically among veterans (Brown et al., 2016; Walser et al., 2015), and both IPT and CBT-D were shown effective in diminishing thoughts of suicide in a civilian sample (Weitz, Hollon, Kerkhof, & Cuijpers, 2014). Regarding gender, Kryszynska, Batterham, and Christensen (2017) reported superior responses to treatment among women in 33% of the studies they reviewed in a systematic review of psychosocial interventions for suicidal ideation and behavior. Treatment efficacy in reducing suicidal ideation or suicidal behavior did not differ by gender in the remaining studies. Notably, few of the reviewed studies examined EBPs for depression. Last, previous research on IPT and CBT-D from a large nonveteran sample found no associations between gender and treatment-related reductions in suicidal ideation (Weitz et al., 2014). Against this conflicting background, additional research is needed to determine whether gender plays a role in moderating the effectiveness of evidence-based treatments for depression among veterans experiencing suicidal ideation.

Objectives

The VHA has been actively implementing a national initiative to disseminate and implement EBPs including CBT-D, IPT, and ACT-D. Since the initiative began in 2008, approximately 2,700 clinicians have received competency-based training to provide EBPs for the treatment of depression (for more details about the VA's EBP training initiative, see Karlin & Cross, 2014). The first objective of the current program evaluation analysis was to examine the overall impact of participation in EBP for depression on suicidal ideation. We expected that participation in EBP for depression would be associated with statistically significant

decreases in suicidal ideation across treatments and gender. Our second objective was to explore whether gender moderated patients' response to treatment over time. The third and final objective was to examine whether treatment response varied by type of EBP treatment received.

Methods

Program Procedures

Data for the present program evaluation analysis were collected as part of the VA EBP Training Programs for CBT-D, IPT, and ACT-D between 2008 and 2013. During this timeframe, the CBT-D, IPT, and ACT-D training programs provided competency-based training consisting of participation in a 3-day workshop followed by 6 months of weekly case consultation via telephone. Training participants were VA mental health clinicians who provided psychotherapy services to veterans with depression. Training workshops included didactic and experiential training focused on developing the knowledge and skills essential for effective treatment delivery. Case consultation involved verbal discussion of cases, review of audio-recorded therapy sessions, and support of the development and implementation of therapy-specific skills. Weekly consultation calls were conducted by trained experts in CBT-D, IPT, or ACT-D, with an average of four clinicians per consultation group. Detailed descriptions of the CBT-D, IPT, and ACT-D training programs have been previously reported by Karlin et al. (2012), Stewart et al. (2014), and Walser et al. (2013), respectively.

The CBT-D protocol was adapted specifically for veterans and military service members and is designed to be administered in 12–16 individual sessions (Karlin et al., 2012). The IPT protocol consists of up to 16 weekly individual psychotherapy sessions across three phases of treatment: initial (sessions 1–3), intermediate (sessions 4–13), and termination (sessions 14–16; Weissman, Markowitz, & Klerman, 2000). The ACT-D protocol is a 12-session manual specific to the delivery of ACT for depression with veterans (Walser, Sears, Chartier, & Karlin, 2012). Patients were veterans with a primary presenting problem of a depressive disorder. IPT had the additional requirement that patients were experiencing current problems involving a considerable life change, conflict with an important person, interpersonal deficits, and/or the death of an important person (Stewart et al., 2014).

Clinicians taking part in EBP training agreed to participate in program evaluation, which included collecting and reporting treatment outcome measures administered to at least two veterans engaged in therapy while receiving case consultation. Outcome data were collected as a part of the routine program evaluation for the VA National EBP Training Program. Data collection and statistical analyses were reviewed and determined to be consistent with nonresearch quality improvement activities by the chief consultant of the VA Office of Mental Health and Suicide Prevention.

Measures

Demographics

Clinicians collected demographic information from each patient, including age, gender, level of education, race, and ethnicity.

Depression and suicidal ideation

The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a well-established 21-item self-report measure

used to assess depression severity. The BDI-II was administered in three waves: at the outset of treatment (before or at session 1), midtreatment (approximately session 7), and during the final session. Each item is scored on a 0 to 3 scale. The total score is the sum of all items (range, 0–63), with higher scores indicating greater symptom severity. Suicidal ideation was assessed via patients' score on item nine of the BDI-II, which is a four-level scale where 0 = "I don't have any thoughts of killing myself"; 1 = "I have thoughts of killing myself, but I would not carry them out"; 2 = "I would like to kill myself"; and 3 = "I would kill myself if I had the chance." Previous research identified that successive BDI-II item nine ratings were associated with increased suicide risk, with a score of 1 being an optimal cutoff for predicting long-term risk for death by suicide, and a score of 2 being predictive of more proximal suicide attempts (Green et al., 2015).

Patients

Data were collected from a total of 3,703 veterans who participated in CBT-D, IPT, or ACT-D for the treatment of depression. To focus this report on the effect of treatment on suicidal ideation, the sample was restricted to patients who endorsed a score of 1 or higher on item nine of the BDI-II, indicating the presence of suicidal ideation. The final analysis sample was comprised of 1,416 male veterans and 364 female veterans (21.1%), including 844 participants in CBT-D (21.7% female), 271 participants in IPT (22.8% female), and 665 patients in ACT-D (19.4% female). Notably, the prevalence of gender did not vary by treatment, $\chi^2(2) = 2.194, p = .34$. Demographics for the sample are shown in Table 1.

Data Analysis Plan

Evaluation of the primary outcome, suicidal ideation severity, was based on a set of generalized linear models using the GENMOD procedure available through SAS 9.4 (SAS Institute, Cary,

Table 1
Demographic Characteristics of Patients by Type of EBP Treatment Received

Treatment	N	Mean or %	SD
Total sample (N = 1,780)			
Women	364	20.4%	
Age		52.4	12.6
Caucasian	1364	77.8%	
Education		3.26	1.13
IPT cohort (n = 271)			
Women	58	21.4%	
Age		55.7	13.2
Caucasian	210	79.8%	
Education		3.17	1.13
CBT-D (n = 844)			
Women	181	21.5%	
Age		51.9	12.5
Caucasian	656	78.8%	
Education		3.19	1.10
ACT-D (n = 723)			
Women	125	18.8%	
Age		51.8	12.4
Caucasian	498	75.8%	
Education		3.38	1.15

Abbreviations: ACT-D, acceptance and commitment therapy for depression; CBT-D, cognitive-behavioral therapy for depression; EBP, evidence-based psychotherapies; IPT, interpersonal psychotherapy; SD, standard deviation. Owing to missing data on race, denominators for calculating race proportions are $n = 1,752$ for total sample, $n = 263$ for IPT, $n = 832$ for, and $n = 657$ for ACT-D.

NC). Generalized linear models are based on link functions that allow exponentially distributed variables to be modeled as linear. They also accommodate longitudinal (correlated) data using generalized estimating equations capable of incorporating a wide variety of time-dependent covariance structures. For the current analysis, the primary outcome measure, suicidal ideation severity, was analyzed using an assumed negative binomial distribution with a log link. This distribution, based on non-negative integer values, is similar to a Poisson distribution, but without the restrictive equivalence of mean and variance required of the latter. GENMOD procedures use all available pairs in estimating covariances and standard errors; under assumptions that missing data occur completely at random, these procedures have been shown to provide valid estimates. Covariance structure in all instances was assumed to be first-order autoregressive (i.e., correlations between repeated items were assumed to diminish exponentially with temporal distance). The ordinal outcome measure (BDI-II item nine) was regressed on models including various combinations of program, wave, and gender entered as both main effects and as a variety of interaction terms depending on the question; the baseline level of depression severity (operationalized as the total BDI-II score at baseline after removing item nine) was included in all models to account for initial severity of depression at the outset of treatment. In most instances, analyses were designed to test bivariate differences between conditions based on combinations of factors including gender, treatment, and wave. Specific contrasts were estimated using model-derived least square mean (LSM) estimates. Based on the substantial gender discrepancy in sample size and to avoid complexities of interpretation inherent in three-way interactions, relative efficacies of the three EBP over time were assessed in gender-stratified subsamples. Because these analyses were primarily descriptive and exploratory, results are presented in unadjusted format.

Primary analyses were supplemented with a secondary responder analysis, with a treatment response defined as a zero score on the BDI-II item nine suicide item as assessed at the final session; in instances when the latter was missing, the response was based on mid-session data. Proportion of treatment

responses was assessed across gender and program using standard chi square analyses to assess the magnitude of proportional differences between factors.

Results

Overall Impact of EBP Treatment on Suicidal Ideation

Across waves, suicidal ideation decreased sharply, both across and within genders: Summing over gender and treatment, the association between suicidal ideation and wave modeled as a main effect was statistically significant, $\chi^2(2) = 224.01, p = .0001$, with ideation decreasing markedly at each measurement interval. Decreases were most pronounced from wave 1 to wave 2, where ideation scores decreased by 40.5% (model based), followed by a continued 16.9% decrease between wave 2 and wave 3, relative to the wave 1 score. In total, ideation scores decreased by 57.4% over the course of therapy (Table 2).

Impact of Gender on Suicidal Ideation

Across treatments, a Gender \times Time interaction was associated with reduced ideation among women veterans, $\chi^2(2) = 9.26, p = .001$. LSM estimates between men and women favoring women were not statistically significant at wave 1 or wave 2 and emerged as statistically significant at wave 3 (LSM difference = -0.32, $p = .005$; Table 2; Figure 1).

Impact of Type of EBP Treatment Received on Suicidal Ideation

Across gender, a Treatment \times Time interaction did not reach statistical significance, $\chi^2(4) = 9.21, p = .056$. Within all three treatments, suicidal ideation decreased from wave 1 to wave 3 (Table 2). Comparisons between treatments at each wave were not statistically significant.

Table 2
Suicidal Ideation Scores by Wave, Gender, and Treatment

Variable	Wave 1			Wave 2			Wave 3		
	n	Mean	SE	n	Mean	SE	n	Mean	SE
Sample mean									
Total sample (N = 1,780)	1,780	1.10	0.01	1,318	0.68	0.02	1,089	0.53	0.02
Gender									
Men (n = 1416)	1,416	1.11	0.01	1,017	0.72	0.02	852	0.56	0.02
Women (n = 364)	364	1.10	0.02	250	0.62	0.04	197	0.39	0.04
EBP									
IPT (n = 271)	271	1.08	0.02	223	0.64	0.04	185	0.43	0.04
CBT-D (n = 844)	844	1.11	0.01	609	0.64	0.03	481	0.50	0.03
ACT-D (n = 665)	665	1.11	0.01	486	0.77	0.03	423	0.62	0.03
Model-based least squares mean estimate									
Total sample (N = 1,780)	1,780	1.09	0.01	1,267	0.65	0.03	1,049	0.46	0.026
Gender									
Men (n = 1416)	1,416	1.07	0.02	1,017	0.71	0.02	852	0.55	0.023
Women (n = 364)	364	1.08	0.02	250	0.60	0.05	197	0.40	0.042
EBP									
IPT (n = 271)	271	1.07	0.02	220	0.60	0.06	182	0.37	0.051
CBT-D (n = 844)	844	1.09	0.01	579	0.62	0.03	458	0.47	0.034
ACT-D (n = 665)	665	1.12	0.02	468	0.74	0.04	409	0.57	0.041

Abbreviations: ACT-D, acceptance and commitment therapy for depression; CBT-D, cognitive-behavioral therapy for depression; EBP, evidence-based psychotherapies; IPT, interpersonal psychotherapy; SE, standard error.

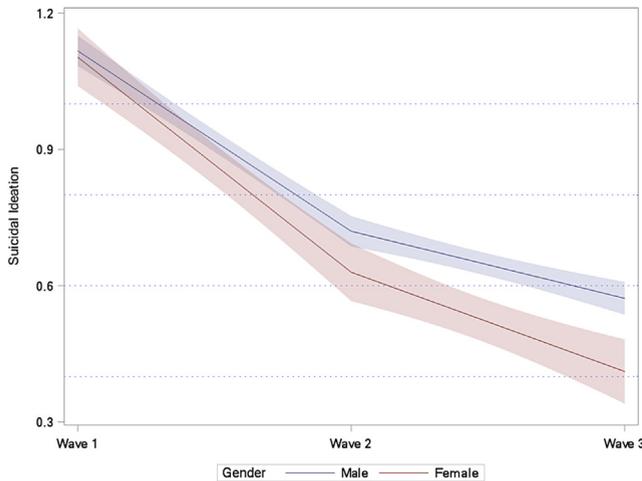


Figure 1. Plot of the Gender × Wave interaction (N = 1,780) showing reductions over time in suicidal ideation by gender.

Gender by Treatment Effects on Suicidal Ideation

To preclude interpreting three-way interactions, analyses addressing gender-related treatment differences were conducted on gender-stratified subsets of the study cohort. Within the male cohort, the association between suicidal ideation and

the difference in Wave x Treatment interaction was statistically significant, ($\chi^2 [4] = 16.82, p = .002$). Using LSM contrasts to explore wave-to-wave differences, suicidal ideation decreased over the course of therapy irrespective of treatment modality, that is, summing across treatments (Table 3), with the greatest decreases in ideation taking place moving from wave 1 to 2; changes at the treatment level were similar (Table 3). Exploring the magnitude of symptom levels between treatments by wave revealed programmatic differences. Decreases in the LSM-estimated ideation symptom levels were decreased in male patients receiving treatment in either the IPT or CBT-D modalities relative to levels in ACT-treated patients (Table 3; Figure 2) at both waves 2 and 3. Presented as percent change, based on the change in the LSM estimates for suicidal ideation at wave 1 and 3, male patients in IPT and CBT-D experienced decreases in ideation severity over the course of therapy of 61.1% and 52.6%, respectively, relative to a decrease of 41.1% for ACT-treated veterans.

Repeating analyses within the female stratum, in contradistinction with results reported above for male patients, the Treatment × Wave interaction was not statistically significant, $\chi^2 (4) = 3.41, p = .492$. As with male veterans, wave-to-wave ideation severity based on LSM estimates decreased markedly over the course of therapy both across (Table 3) and within treatments (Table 3; Figure 2). Again mirroring effects observed among men, decreases in symptomology were most pronounced between the outset of therapy and its midpoint. Comparable percentage-wise decreases in suicidal ideation severity over the

Table 3
Mean Differences by Wave and Treatment and Gender

Test	Women				Men			
	Diff	SE	z-Val	Pr > z	Diff	SE	z-Val	Pr > z
Differences in waves by treatment								
All								
W1 vs W2	0.59	0.08	7.50	<.001	0.49	0.06	7.71	<.001
W1 vs W3	1.01	0.11	9.52	<.001	0.70	0.04	17.24	<.001
W2 vs W3	0.42	0.11	3.94	<.001	0.26	0.04	7.04	<.001
IPT								
W1 vs W2	0.66	0.19	3.41	<.001	0.49	0.06	7.71	<.001
W1 vs W3	1.29	0.26	4.99	<.001	0.83	0.09	8.79	<.001
W2 vs W3	0.63	0.27	2.30	0.02	0.34	0.08	4.02	<.001
CBT-D								
W1 vs W2	0.61	0.09	6.52	<.001	0.52	0.04	11.95	<.001
W1 vs W3	0.94	0.13	7.13	<.001	0.75	0.06	12.73	<.001
W2 vs W3	0.33	0.12	2.67	0.01	0.23	0.05	4.12	<.001
ACT								
W1 vs W2	0.50	0.10	5.16	<.001	0.32	0.04	8.07	<.001
W1 vs W3	0.81	0.13	6.10	<.001	0.53	0.05	10.49	<.001
W2 vs W3	0.31	0.12	2.62	0.01	0.21	0.04	4.69	<.001
Differences in treatments by wave								
Wave 1								
IPT vs CBT	0.00	0.04	0.06	0.95	-0.03	0.02	-1.38	0.17
IPT vs ACT	-0.08	0.05	-1.47	0.14	-0.01	0.02	-0.54	0.59
CBT vs ACT	-0.08	0.04	-1.90	0.06	0.02	0.02	1.07	0.29
Wave 2								
IPT vs CBT	-0.05	0.23	-0.22	0.82	0.00	0.08	-0.06	0.95
IPT vs ACT	-0.24	0.22	-1.06	0.29	-0.18	0.08	-2.40	0.02
CBT vs ACT	-0.19	0.13	-1.41	0.16	-0.18	0.06	-2.93	0.00
Wave 3								
IPT vs CBT	-0.34	0.29	-1.18	0.21	-0.12	0.11	-1.03	0.30
IPT vs ACT	-0.56	0.29	-1.92	0.06	-0.32	0.11	-2.86	0.00
CBT vs ACT	-0.21	0.19	-1.14	0.26	-0.20	0.08	-2.50	0.01

Abbreviations: ACT-D, acceptance and commitment therapy for depression; CBT-D, cognitive-behavioral therapy for depression; IPT, interpersonal psychotherapy; SE, standard error.

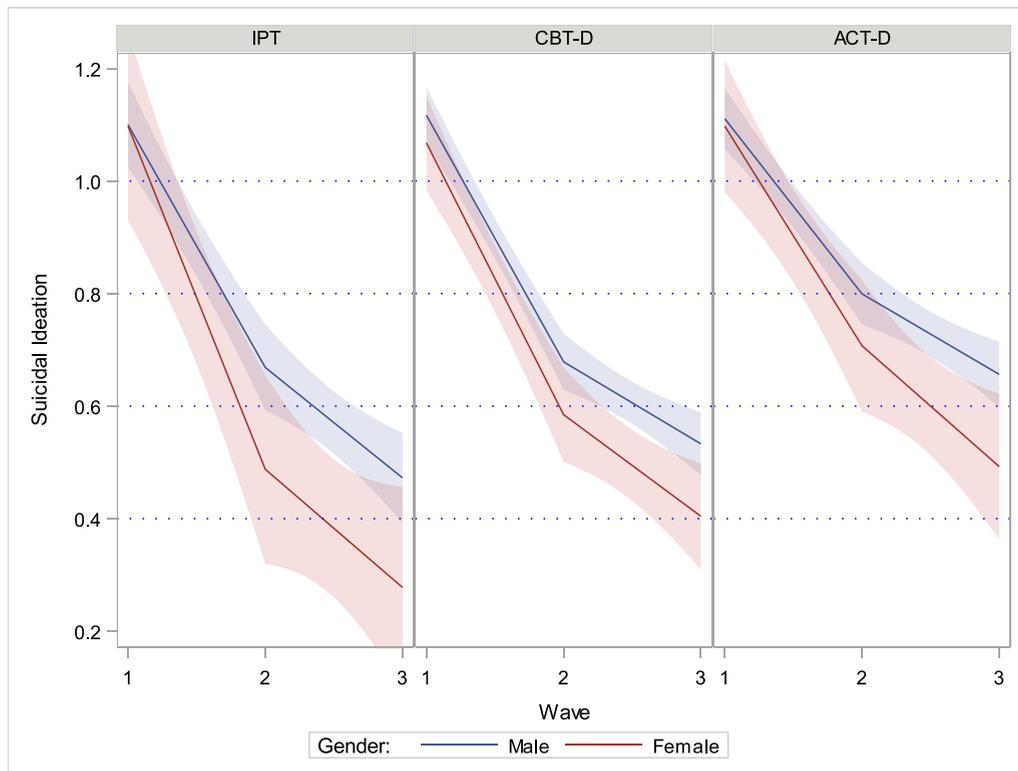


Figure 2. Results of loess regressions showing reductions over time in suicidal ideation by treatment and gender.

course of therapy for IPT, CBT-D, and ACT were 72.4%, 61.0%, and 55.4%, respectively.

Responder Analyses

Results of responder analyses were generally consistent with results of primary analyses. Rates of response among men differed across programs (Table 4). In subsequent bivariate comparisons between programs, the proportions of male responders in both IPT, $\chi^2 = 5.63$; $p = .018$, and CBT-D, $\chi^2 = 7.82$; $p = .005$, exceeded rates observed for veterans treated in ACT-D (Table 4); proportional differences in response levels between CBT-D and ACT-D programs did not differ significantly, $\chi^2 = 0.07$; $p = .796$. Among women, the rate of response did not differ significantly between programs. The proportions of female responders across programs were slightly higher relative to men but similar in pattern; however, as indicated by the omnibus test, above, $\chi^2 = 3.798$; $p = .150$, bivariate tests of proportional program differences between female responders failed to attain statistical significance. The lack of statistical significance between programs in part may reflect a type II error related to limited sample size. The proportion of responders among female participants across all programs exceeded the proportion of male responders across programs, although this difference was not statistically significant (54.7%–48.0%; $\chi^2 = 3.73$; $p = .053$). Within programs, the response rates for women treated within IPT exceeded levels observed in male participants by more than 14%, although the difference was not statistically significant ($\chi^2 = 2.91$; $p = .088$). Gender differences between veterans in the remaining two programs also did not differ significantly (Table 4; CBT-D: $\chi^2 = 0.36$; $p = .548$; ACT-D: $\chi^2 = 1.39$; $p = .238$).

Attrition

Associations between attrition at both waves 2 and 3 and veterans' BDI-II item nine scores at the immediately preceding wave were nonsignificant, as were tests of wave 3 attrition based on wave 1–wave 2 difference scores. The tests were repeated using the full BDI-II measure as well as a set of available demographic covariates. In all instances, results were not statistically significant. Owing to the absence of any apparent systematic associations within variables present in the data, missing data were assumed to occur at random.

Discussion

Our findings in a large clinical sample of veterans participating in EBPs for depression found that CBT-D, IPT, and ACT-D each accomplished reductions in suicidal ideation, with decreases evident by treatment midpoint. These findings add to the emerging literature examining the impact of depression treatments on suicidal ideation. Although published findings on putative gender differences in treatment response for interventions targeting suicidal ideation are conflicting, these results describe greater decreases in the severity of suicidal ideation among women relative to men. These findings demonstrate that interventions with a strong evidence base for treating depression are concurrently effective in decreasing suicidal ideation among veterans and, as suggested, may be particularly effective in decreasing suicidal ideation in women veterans. Although women veterans showed sharper declines in suicidal ideation severity with treatment, responder analyses revealed that women were not more likely to evidence elimination of ideation relative to men.

Table 4
Treatment Responders

Program	Men			Women					
	No Response	Response	Totals	No Response	Response	Totals			
Program by gender									
IPT	85 (47.5%)	94 (52.5%)	179	15 (33.3%)	30 (66.7%)	45			
CBT-D	229 (48.6%)	242 (51.4%)	471	57 (45.6%)	68 (54.4%)	125			
ACT-D	233 (58.1%)	168 (41.9%)	401	44 (51.2%)	42 (48.5%)	86			
Totals	547	504	1051	116	140	256			
Contrast	χ^2	<i>p</i>		χ^2	<i>p</i>				
Overall	9.6043	.0082		3.7979	.1497				
IPT vs CBT	0.07	.7961		2.04	.1533				
IPT vs ACT	5.63	.0176		3.79	.0514				
CBT vs ACT	7.82	.0052		0.63	.4267				
	IPT		CBT-D		ACT-D				
	No Response	Response	Totals	No Response	Response	Totals	No Response	Response	Totals
Gender by program									
Men	85 (47.5%)	94 (52.5%)	179	229 (48.6%)	242 (51.4%)	471	233 (58.1%)	168 (41.9%)	401
Women	15 (33.3%)	30 (66.7%)	45	57 (45.6%)	68 (54.4%)	125	44 (51.2%)	42 (48.8%)	86
Totals	100	124	224	286	310	596	277	210	487
Contrast	χ^2	<i>p</i>		χ^2	<i>p</i>		χ^2	<i>p</i>	
Men vs women	2.91	.0878		0.36	.548		1.39	.2382	

Abbreviations: ACT-D, acceptance and commitment therapy for depression; CBT-D, cognitive-behavioral therapy for depression; IPT, interpersonal psychotherapy.

Owing to the limited available data comparing the effectiveness of ACT-D to other EBPs for depression in decreasing suicidal ideation (Tighe, Nicholas, & Christensen, 2018), our finding that ACT-D was less effective in this analysis is novel. Furthermore, gender-stratified analyses demonstrated that this effect was largely driven by the poorer response of male veterans to ACT-D relative to IPT and CBT-D. It may follow that IPT and CBT-D are preferable treatments for male veterans reporting suicidal ideation; however, as previously suggested in a review (Tighe et al., 2018), unequivocal evaluation of gender differences in treatment of depression and suicidality would require rigorous controlled trials with appropriate randomization of men and women across treatments (including ACT-D). Supporting this, a meta-analysis of ACT-D studies noted that studies with greater proportions of men were associated with larger effect sizes (Öst, 2014), thus indicating that design artifacts in outcomes related to depression warrant subgroup analysis by gender.

Limitations

The generalizability of these program evaluation findings is increased by the provision of the therapies by clinicians receiving training, the relatively few exclusions, and the use of routine clinical referral pathways to identify patients. Conversely, results are limited by the lack of experimental assignment to treatments and the unavailability of data concerning concurrent treatments and clinician factors that might have influenced changes in clinical outcomes. It must also be noted that clinicians received expert consultation during treatment provision, which does not reflect routine clinical practice. Additionally, although ACT-D was designed as a 12-session treatment, IPT and CBT-D protocols allowed up to 16 sessions of treatment, a difference in dose that may account for the greater decreases in symptoms experienced by men in IPT and CBT-D relative to ACT-D by the wave 3 measurement. Arguing against this supposition, it is noteworthy that differences were observed between ACT-D and both IPT and CBT-D among men by wave 2, indicating that differences were

evident before differences in treatment dose. Veterans lost to follow-up and resulting missing data also present limitations, and conclusions cannot be drawn about the status of veterans without data at all waves.

These results are further limited by the single-item measure of suicidal ideation used in the present analyses. Although BDI-II item nine has been shown to be a valid measure for assessing suicidal ideation (Desseilles et al., 2012), there are more optimal measures, and future work in this area would benefit from the use of a longer, more reliable assessment of suicidal ideation. The present results also cannot specify that any reduction in suicidal ideation evidenced through participation in EBPs for depression results in subsequent reduction in risk of suicidal behavior; thus, future research would benefit from longitudinal assessment of suicidal ideation and attempts. Finally, these conclusions are limited by a lack of data to characterize the factors associated with suicide risk beyond suicidal ideation, most notably any history of suicide attempts or psychiatric hospitalizations.

Implications for Practice and/or Policy

The results of this report support the effectiveness of EBPs for depression for decreasing suicidal ideation in veterans. They also support the inclusion of veterans experiencing suicidal ideation as a part of standard VHA clinician training aimed at promoting the generalization of clinician skills and increasing veterans' access to EBPs for depression. We also note that these results provide particularly strong support for the effectiveness of EBPs for depression for reducing suicidal ideation in women veterans. Owing to the rising rate of suicide in women veterans (VA & Office of Mental Health and Suicide Prevention, 2017), greater lifetime prevalence of suicidal ideation and attempts among women (Millner et al., 2017), and association of both depression (Arsenault-Lapierre et al., 2004) and suicidal ideation (Millner et al., 2017) with suicide among women, these findings provide a rationale for facilitating access to EBPs for depression in women veterans with depression. In addition, the relative advantages of

IPT and CBT-D for reducing suicidal ideation in male veterans would perhaps argue for the initiation of strategies designed to tailor treatments for male veterans based on levels of pretreatment suicidal ideation and/or further analysis of gender differences based on more rigorous clinical trial formats as an entrée to matching the strategies suggested elsewhere in this article. Clinical guidance should also inform the role of EBPs for depression in reducing risk of suicide in the context of suicide-focused psychotherapies and other interventions employed in efforts to prevent suicide.

Conclusions

This program evaluation project provides the first comparison of the clinical effectiveness of three EBPs for depression for reducing suicidal ideation across male and female veterans. This analysis revealed that 1) all three EBPs for depression that were examined resulted in statistically significant reductions in suicidal ideation and reductions were evident by the midpoint of treatment; 2) women veterans reported greater decreases in suicidal ideation severity across all three EBP treatments; and 3) decreases in suicidal ideation were greater among male veterans treated in IPT or CBT-D relative to ACT-D.

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Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.whi.2019.04.013>.

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