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On the Potential for Iatrogenic Effects of Psychiatric Crisis Services: The Example of Dialectical Behavior Therapy for Adult Women With Borderline Personality Disorder

Trevor N. Coyle, Jennifer A. Shaver, and Marsha M. Linehan
University of Washington

Objective: Although previous research has suggested that people with a history of using psychiatric crisis services are at higher risk for suicide, it is unclear whether this link is attributable to individual risk factors or iatrogenic effects of service utilization. We examined this question by analyzing data from a randomized controlled trial of dialectical behavior therapy (DBT), a treatment for highly suicidal individuals in which patients took advantage of crisis services less than those in the comparison condition. We hypothesized that crisis-service utilization during a treatment year, rather than pretreatment indicators of suicide risk, would be associated with higher suicide risk after treatment, and that DBT's treatment effects would be partially attributable to this association. ***Method:*** Participants were 101 women (M_{age} = 29.3, 87% Caucasian) with recent suicidal and self-injurious behaviors meeting *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association [APA], 1994) criteria for borderline personality disorder. We examined relationships between suicidal ideation (using the Suicide Behaviors Questionnaire; Linehan, 1981), number of suicide attempts (using the Suicide Attempt Self-Injury Interview; Linehan, Comtois, Brown, Heard, & Wagner, 2006), and number of psychiatric inpatient admissions and psychiatric emergency-room (ER) visits (using the Treatment History Interview; Linehan & Heard, 1987) from the years prior to, during, and following treatment. ***Results:*** Treatment-year psychiatric ER visits were the sole predictor of the number of follow-up year suicide attempts. Treatment condition and pretreatment inpatient admissions predicted treatment-year psychiatric ER visits. Finally, there was evidence that DBT resulted in fewer suicide attempts at follow-up, in part because getting DBT led to fewer psychiatric ER visits. ***Conclusion:*** In this population and context, data suggest that crisis-service utilization conveys risk for suicide. DBT may reduce suicide risk in part by reducing use of these services.

What is the public health significance of this article?
This study suggests that, for highly suicidal individuals meeting criteria for borderline personality disorder, psychiatric crisis-service utilization (e.g., psychiatric emergency-room visits) may be directly and uniquely predictive of subsequent suicidal behaviors. Treatments that minimize the use of psychiatric crisis services—like dialectical behavior therapy—may be particularly beneficial for reducing risk for suicide.

Keywords: suicide, DBT, hospitalization, psychological treatment, psychiatric crisis services

Although there has been a belief that acute risk for suicidal behavior is best dealt with by hospitalization, recent research suggests that inpatient hospitalization is associated with an increased risk for death by suicide. For instance, an analysis of death records in Denmark between 1981 and 1997 revealed that 37% of men and 57% of women who died by suicide had histories of inpatient hospitalization for suicidality (Qin & Nordentoft, 2005). The same study found that, controlling for various demographic variables, the risk of death by suicide within the first week following discharge from hospitalization was 100 times greater than matched controls for men and 246 times greater for women. In addition, a national population-based case-control study (Hunt et al., 2008) found that 43% of suicides following hospital discharge occurred within the first month after discharge. Hunt et al. also noted that discharged patients were at particularly high risk for suicide during the first day and week postdischarge. Finally, this type of relationship may extend to include other forms of crisis-service use, such as emergency-room (ER) visits that occur for other psychiatric reasons. Specifically, a recent study of national registers found that those who had any ER contact for psychiatric

Trevor N. Coyle, Jennifer A. Shaver, and Marsha M. Linehan, Department of Psychology, University of Washington.

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Correspondence concerning this article should be addressed to Trevor N. Coyle, Department of Psychology, Behavioral Research and Therapy Clinics, Box 351525, University of Washington, Seattle, WA 98195-1525. E-mail: tcoyle@uw.edu

reasons were nearly 30 times more likely to die by suicide than those who had no contact with psychiatric care. Further, those who had been admitted to a hospital were nearly 45 times more likely to die by suicide than no-contact controls matched on age, sex, and year of death (Hjorthøj, Madsen, Agerbo, & Nordentoft, 2014).

Reasons for these relations remain a matter of debate. Some argue that people most likely to use psychiatric crisis services may simply be more severely suicidal and thus more likely to die by suicide (Hjorthøj et al., 2014). Others argue that psychiatric crisis services themselves may directly and causally increase suicide risk (Large & Ryan, 2014; Large, Ryan, Walsh, Stein-Parbury, & Patfield, 2014; Linehan, Comtois, Murray et al., 2006). Randomized controlled trials (RCTs) that longitudinally assess suicidal behavior and psychiatric crisis-service utilization offer a uniquely suitable option for examining this issue, and given that dialectical behavior therapy (DBT) has been shown to reduce the frequency of both suicidal behavior and psychiatric crisis-service use in inpatient admissions and hospital days (Carter, Wilcox, Lewin, Conrad, & Bendit, 2010; Linehan, 1993; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), DBT was chosen as the framework for the current study.

DBT has a robust evidence base supporting its efficacy in the treatment of suicidal behavior, particularly among individuals diagnosed with borderline personality disorder (BPD; Kliem, Kröger, & Kosfelder, 2010; Linehan, Comtois, Murray, et al., 2006; McMain, et al., 2009). Although DBT includes multiple components that likely contribute to its efficacy in reducing suicidal behavior (e.g., skills training, use of global skills; Linehan et al., 2015; Neacsiu, Rizvi, & Linehan, 2010), one potentially important characteristic of DBT involves its bias against using crisis services to address episodes of acute suicide risk. In fact, Linehan (1993) specifically posited that hospitalizations may increase risk for suicidal behavior. For instance, by both removing the demands of life that may contribute to strong negative emotions and preventing the client from learning to manage emotions in daily contexts, hospitalization may serve to negatively reinforce suicidal behavior and block the use of more skillful responses to emotional distress (Paris, 2004). Moreover, chronic hospitalization/ER use may hamper quality of life by leading to stigma, interpersonal conflict, job loss, and increased financial burden (Large et al., 2014). Because of the gravity of these theorized functional consequences of hospitalization, DBT therapists aim to reduce hospital use for suicide-crisis management regardless of the client's clinical presentation and suicide severity. Thus, although hospital care is still employed in DBT to manage suicide risk, DBT therapists use inpatient hospitalization and psychiatric ER visits far less than therapists practicing other models (Linehan & Heard, 1999; Prendergast & McCausland, 2007). Notably, this reduction in hospital and inpatient visits accounts for the vast majority of cost savings in DBT. A study by the American Psychiatric Association found that, comparing costs while receiving DBT with costs during the prior year with no DBT, a community-based DBT program decreased hospital costs by over $25,000 per client by reducing face-to-face emergency contact, hospital days, and partial hospitalizations by over 70% (APA, 1998). Another study found that, compared with DBT, those receiving treatment as usual (TAU) incurred six times more costs because of the high cost of inpatient bed days (Pasieczny & Connor, 2011). Though other intervention ingredients likely contribute to outcomes, this intervention characteristic and its potential role in producing DBT's suicide-reducing outcomes have gone unstudied.

In the current investigation, we aimed to use data collected from a large RCT of DBT in which DBT demonstrated superior reductions in suicide attempts and crisis-service use compared with the control condition. Secondary analyses were used to (a) examine the longitudinal relationships between standard forms of crisis care and suicide attempts in the context of psychological treatment and (b) conduct a preliminary investigation regarding whether DBT's rates of crisis-care utilization may partially explain its efficacy in reducing suicide attempts. To generate the most conservative estimates of this relation, we controlled for pretreatment levels of well-documented risk factors for suicide attempts, such as the number of prior suicide attempts (Miranda, Ortin, Scott, & Shaffer, 2014; Borges et al., 2012), number of prior nonsuicidal self-injury (NSSI) episodes (Whitlock et al., 2013), number of prior hospitalizations or ER visits (Luxton, Trofimovich, & Clark, 2013), suicidal ideation (Prinstein et al., 2008), the presence or absence of a suicide plan (Nock et al., 2008), and the availability of lethal means (Yip et al., 2012).

We hypothesized the following: (a) Treatment-year crisis-service utilization (i.e., psychiatric hospitalization and ER visits for psychiatric reasons) uniquely predicts suicide attempts during the follow-up period after controlling for pretreatment suicide-risk factors and history of psychiatric crisis-service use; (b) No pretreatment suicide-risk factor predicts crisis-service utilization during the treatment year, nor does pretreatment psychiatric crisis-service use; (c) Fewer instances of crisis-service utilization during the treatment year partially explains the relationship between receiving DBT and fewer suicide attempts during follow-up.

Method

Participants

Participants included 101 adult women (M_{age}= 29.3 years, SD_{age}= 7.5 years) who met criteria for BPD per the *International Personality Disorder Examination* (*IPDE;* Loranger, 1995) and the *Structured Clinical Interview for Personality Disorder (SCID-II) for* DSM–IV (First, Spitzer, Gibbons, Williams, & Benjamin, 1996) and who had at least two suicide attempts or NSSI episodes in the past 5 years, with at least one such episode of self-injurious behavior in the past 8 weeks. Exclusion criteria included (a) the presence of any psychotic disorder, bipolar disorder, or any severe developmental disability, (b) severe seizure disorders requiring medication management, (c) a court mandate to treatment, and (d) the need for a primary treatment for another debilitating condition (e.g., life-threatening anorexia nervosa). Participants were randomized to receive either DBT (n = 52) or community treatment by experts (CTBE; n = 49), a treatment delivered by nonbehavioral community clinicians nominated as experts in treating difficult clients. More thorough descriptions of the interventions and their characteristics are provided in the original RCT (Linehan, Comtois, Murray et al., 2006), and participant characteristics are described in Table 1.

Assessment Instruments

The Suicide Attempt Self-Injury Interview (SASII; Linehan, Comtois, Brown, Heard, & Wagner, 2006) was used to assess total

Table 1
Baseline Demographic Characteristics

Variable	DBT group (n = 52)	CTBE group (n = 49)	Total (N = 101)
Age in years, mean ± *SD*	29.0 ± 7.3	29.6 ± 7.8	29.3 ± 7.5
Race, White (%)	86.5	87.7	87.0
Single, divorced, or separated (%)	88.4	85.7	87.2
Education, college graduate or above (%)	25.0	22.4	23.8
Annual income, >30,000 (%)	9.6	10.2	9.9

Note. DBT = dialectical behavior therapy; CTBE = community treatment by experts. No values were statistically significant between treatment conditions. Analyses were conducted using the t test and Mann–Whitney test, as appropriate.

numbers of suicide attempts and NSSI episodes that occurred during each assessment period. This measure has demonstrated excellent psychometric properties, with adequate validity demonstrated by comparison with rigorous collateral measures and strong interrater-reliability scores, ranging from *good* to *excellent* (Linehan, Comtois, Brown et al., 2006). Total numbers of voluntary and involuntary psychiatric inpatient admissions and ER visits that occurred for psychiatric reasons (e.g., suicidal ideation, substance abuse, etc.) during each assessment period were assessed using the Treatment History Interview (THI; Linehan & Heard, 1987). The THI has not been subjected to peer-reviewed psychometric evaluation, but because it provides rich data regarding the frequency and types of services accessed across assessment periods, we extracted data from this measure for the present analyses. Similarly, data were extracted from the Suicidal Behaviors Questionnaire (SBQ; Linehan, 1981) regarding suicidal ideation, suicide planning, and access to means. For this study, we summed three items (α = .63): One item assessed ideation in the past year ("How often have you thought about killing yourself in the last year?"), with answers ranging from 0 (*Not at all*) to 4 (*Very often*); one item assessed the presence or absence of a current suicide plan ("Do you currently have a plan for how you would go about killing yourself if you decided to do it?"), with answers ranging from 0 (*No*) to 2 (*Yes, a definite plan*); and one item assessed the presence or absence of current access to lethal means for suicide ("If you decided to kill yourself at this point in your life, would the means for carrying out such an action be available to you?"), with answers ranging from 0 (*No*) to 2 (*Yes, definitely*).

Treatments

Dialectical behavior therapy. DBT is a cognitive–behavioral psychotherapeutic approach originally developed to treat highly suicidal women meeting criteria for BPD (Linehan, 1993). Standard DBT consists of four concurrent modes of therapy: weekly individual therapy to enhance motivation (1 hr/week), weekly group-skills training to enhance capabilities and increase behavioral repertoires (2.5 hr/week), telephone coaching to ensure generalization of the skills to the environment (as needed), and weekly team consultation meetings for DBT therapists to enhance therapist capabilities and support their motivation (1.5 hr/week).

Community treatment by experts. The CTBE condition was specifically designed in the parent RCT to control for general factors associated with receiving expert psychotherapy to test whether factors specific to DBT were driving outcomes (Linehan, Comtois, Murray et al., 2006). Thus, the CTBE condition was an uncontrolled, nonbehaviorally-oriented TAU-like condition in which therapists were (a) nominated by community health leaders as being experts in treating difficult-to-treat patients, (b) asked to provide the type and dose of treatment they believed was most suited to the patient, with a minimum of 1 hr of individual therapy per week, (c) offered the option of attending a clinical supervision group analogous to the DBT consultation team, (d) offered clinical supervision through the Seattle Psychoanalytic Society, which is an institution whose prestige rivals that of the University of Washington's outside of behavioral therapy (e) contacted by the participant coordinator, who established independent relationships with subjects in both conditions, to assist subjects in getting to the first session, (f) offering therapy at the same rate as study therapists offering DBT, and (g) matched to the DBT condition on sex and training (e.g., doctor's vs. master's degrees). Results from the RCT show that therapists in the CTBE condition had, on average, more years of clinical experience than therapists in the DBT condition, which was expected because they were specifically nominated for their expertise.

Study Procedures

Participants provided informed consent and were randomized to condition using a computerized adaptive minimization randomization procedure, which matched participants to condition on (a) lifetime suicidal and NSSI episodes, (b) lifetime psychiatric hospitalizations (c) whether participants had a history of only suicide attempts, only NSSI, or a history of both kinds of behavior (d) participant age and (e) scoring higher than a 30 on the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) or below a 45 on the Global Assessment of Functioning (Linehan, Comtois, Murray et al., 2006). All participants were assigned to receive 1 year of treatment, and assessments were completed at baseline, every 4 months during treatment, and at 1-year follow-up. Assessments were conducted by trained assessors who were blind to treatment condition. Interclass correlation coefficients for all assessment ratings ranged from .74 to 1.

Data-Analysis Plan

Given the low-frequency nature of our data, we considered testing our hypotheses using Poisson generalized estimating equations (GEE) and negative binomial GEE statistical models. After

fitting our models in both distributions, lower values for Akaike information criteria (AIC) and Bayesian information criteria (BIC) suggested the negative binomial GEE to be the best fitting model for all analytic questions. We replicated these findings using logistic regression to account for the fact that there were few people with more than one suicide attempt between study end and follow-up. To make GEE results interpretable, negative binomial regression coefficients were exponentiated to produce incidence-risk ratios (IRR), with values above 1 indicating a higher likelihood of an event-related outcome with increasing levels of a predictor, and values below 1 indicating a lower likelihood of an event-related outcome with increasing levels of a predictor.

We adopted a conservative approach to hypothesis testing by including all theory-driven covariates in each model to maximize chances of detecting nonhypothesized explanatory relations. Initial model fit was characterized using the log-likelihood χ^2 test. Given that the study's hypotheses specify theory-driven directionality, significance of indirect effects was determined using a one-tailed Sobel test. Potential mediation was probed by using deviance testing to compare fit between models that included the independent variable in the mediational relationship of interest and models that trimmed these independent variables. If deviance tests between such models produced nonsignificant χ^2 values in combination with significant indirect effects via Sobel tests, then full mediation was assumed, whereas significant deviance tests combined with significant indirect effects would suggest partial mediation.

Results

Descriptive statistics for all variables across time-points are reported in Table 2. Given that treatment-based differences in follow-up suicide attempts were investigated in the main outcome paper for this study (Linehan, Comtois, Murray et al., 2006), we first examined the relation between follow-up year suicide attempts and a fuller assortment of predictors in order to test our first hypothesis. Results are summarized below for each hypothesis.

Hypothesis 1

Our GEE model included treatment condition, pretreatment suicide-risk factors, and history of psychiatric crisis-service use. Results are reported in Table 3. This model fit the data well and was superior to the intercept-only model. Treatment-year psychiatric ER visits emerged as the sole significant predictor of follow-up year suicide attempts such that, regardless of treatment condition, each additional psychiatric ER visit that occurred during the treatment year was associated with a 30% increased risk of an additional suicide attempt during the follow-up year. Because treatment-year inpatient admissions did not emerge as a significant predictor of follow-up suicide attempts when psychiatric ER visits were included in the model, we chose not to examine its relationship to follow-up suicide attempts in subsequent analytic steps.

Hypothesis 2

We ran a GEE model that included treatment condition, pretreatment suicide-risk factors, and history of psychiatric crisis-service use. Results are shown in Table 4. This model fit the data well and was superior to the intercept-only model. Treatment condition and pretreatment inpatient admissions emerged as the only significant predictors of treatment-year psychiatric ER visits, such that being assigned to the CTBE (vs. DBT) condition was associated with an 88% increased risk of an additional psychiatric ER visits during the treatment year, and controlling for treatment condition, each additional pretreatment inpatient admission was related to an 18% increased risk of an additional psychiatric ER visit during the treatment year.

Hypothesis 3

Sobel tests for significance of indirect effects found evidence for a one-tailed significant indirect effect, $z = 1.69$, $p = .04$, suggesting that participants who received DBT engaged in significantly fewer suicidal acts in the follow-up year, in part because they used

Table 2
Pretreatment, Treatment-Year, and Follow-Up-Year Descriptive Statistics

Variable	Pretreatment-year *M* (*SD*)	Treatment-year *M* (*SD*)	Follow-up-year *M* (*SD*)
DBT condition ($n = 52$)			
Suicide attempts, total	.45 (.64)	.98 (1.46)	.41 (.92)*
NSSI episodes, total	10.37 (23.31)	14.17 (37.63)	5.43 (6.19)
Number of inpatient visits, total	1.58 (2.51)	.37(1.08)**	.64 (2.18)
Number of psychiatric ER visits, total	2.08 (2.42)	.78 (1.10)*	.72 (2.10)
Suicidal ideation, SBQ 3-item score	5.67 (1.88)	NA	NA
CTBE condition ($n = 49$)			
Suicide attempts, total	.87 (1.53)	1.37 (1.87)	.82 (1.66)*
NSSI episodes, total	13.94 (38.52)	18.94 (40.73)	15.93 (60.96)
Number of inpatient visits, total	1.54 (2.15)	1.13 (1.87)**	.37 (.75)
Number of psychiatric ER visits, total	2.51 (3.31)	1.89(2.81)*	.50 (.95)
Suicidal ideation, SBQ 3-item score	5.91 (1.83)	NA	NA

Note. DBT = dialectical behavior therapy; SBQ = Suicidal Behaviors Questionnaire; CTBE = community treatment by experts; NSSI = nonsuicidal self-injury. Variables between conditions during different time periods were compared using the Mann-Whitney test. No values were significantly different between treatment conditions during the pretreatment year. The SBQ was not administered during treatment-year or follow-up assessments, so values for these periods are denoted NA.
Two-tailed * $p < .05$. ** $p < .01$.

Table 3
Prediction of Follow-Up-Year Suicide Attempts (N = 92)

Model fit	Full model with all covariates				
	L. R. χ^2 34.78, $p < .001$		AIC 183.32	BIC 203.67	
Variable	*B*	*SE B*	95% CI	IRR	*p* value
Treatment condition (DBT vs. CTBE)	.11	.42	−.72−.94	1.02	.80
Treatment-year inpatient admissions	.20	.14	−.07−.47	1.26	.14
Treatment-year psych ER visits	.26	.09	.09−.44	1.30	.003
Treatment-year suicide attempts	.19	.13	−.07−.44	.1.14	.14
Pre-tx inpatient admissions	−.07	.09	−.25−.2	.93	.49
Pre-tx psych ER visits	<.01	.07	−.14−.13	1.01	.88
Pre-tx SBQ 3-item score	.10	.14	−.17−.38	1.08	.58

Note. DBT = dialectical behavior therapy; CTBE = community treatment by experts; L. R. = Likelihood ratio; AIC = Akaike information criteria; BIC = Bayesian information criteria; IRR = incidence-risk ratios. Treatment condition was dummy-coded (0 = DBT, 1 = CTBE).

psychiatric ER services less often during treatment. Given the unexpected emergence of pretreatment psychiatric hospitalizations as a predictor of treatment-year psychiatric ER visits, we examined whether people who had more often been psychiatrically hospitalized prior to treatment had higher numbers of suicide attempts after treatment, in part because they used psychiatric ER services more often during treatment. The one-tailed Sobel test supported this hypothesis as well, $z = 1.85$, $p = .03$.

To test whether these indirect effects were consistent with full or partial mediation, we then compared fit between models that included treatment condition and pretreatment inpatient admissions and models that excluded them, with full mediation being supported by statistically equivalent model fit when these independent variables were excluded. In the full model including all predictors and covariates, DBT was not a significant predictor of suicide attempts during the follow-up period (see Table 3). Because there are some cases in which a variable may itself not have a significant direct association with an outcome, but may contribute overall to model fit, we followed this nonsignificant result by removing treatment condition and pretreatment history of psychiatric inpatient admissions from the model to see whether doing so would increase imprecision in predicting suicide attempts during follow-up. In contrast to expectations, removing both treatment condition and pretreatment inpatient admissions from the final model in Table 3 resulted in equivalent model fit, $\Delta\chi^2(2, 92) = 3.15$, $p = .20$. In combination with the above tests of indirect effects, these findings support full mediation for both the relationship between DBT and follow-up suicide attempts, as well as pretreatment inpatient admissions and follow-up suicide attempts.

Discussion

This study was an investigation of the longitudinal relationships between psychiatric crisis-service utilization and suicide attempts in a large RCT of DBT. Our examination first found that treatment-year psychiatric ER visits, and not pretreatment indicators of risk, emerged as the sole significant predictor of suicide attempts during the follow-up year. These results are consistent with the hypothesis that factors inherent in these forms of crisis management may causally contribute to increases in suicide risk and are inconsistent with the hypothesis that pretreatment suicide severity explains the relationship between crisis-service use and suicide (Large, Ryan et al., 2014). Second, in our data, the strongest predictor of ER use during treatment was the number of pretreatment inpatient admissions a person had, and this association was so strong that having a greater number of pretreatment

Table 4
Prediction of Treatment-Year Psychiatric ER Visits (N = 92)

Model fit	Full model with all covariates				
	L. R. χ^2 30.48, $p < .001$		AIC 272.56	BIC 203.67	
Variable	*B*	*SE B*	95% CI	IRR	*p* value
Treatment Condition (DBT vs. CTBE)	.64	.31	.03−1.25	1.88	.04
Pretreatment inpatient admissions, total	.16	.07	.03−.30	1.18	.02
Pretreatment psych ER visits, total	.09	.06	−.02−.21	1.06	.10
Pretreatment suicide attempts	−.08	.15	−.39−.22	.88	.60
Pretreatment NSSI episodes	.01	.01	−.01−.02	1.01	.22
Pre-tx suicidal ideation, SBQ 3-item score	.05	.09	−.13−.23	1.04	.58

Note. DBT = dialectical behavior therapy; CTBE = community treatment by experts; L. R. = Likelihood ratio; AIC = Akaike information criteria; BIC = Bayesian information criteria; IRR = incidence-risk ratios. Treatment condition was dummy-coded (0 = DBT, 1 = CTBE).

admissions indirectly predicted a higher number of follow-up-year suicide attempts via psychiatric ER visits. Thus, it is possible that people with a larger number of pretreatment psychiatric inpatient admissions (who, it can be argued, are more reinforced by hospitalization) have a higher rate of follow-up-year suicide attempts because they more often use psychiatric ER services during the treatment year. In addition, it is unlikely that pretreatment inpatient admissions serve as a proxy for pretreatment clinical risk because statistical models that excluded this variable (but included variables such as pretreatment suicide attempts) failed to produce any statistically significant predictors of treatment-year ER visits, suggesting that inpatient admissions are likely not predictive because they are subsuming variance attributable to other predictors in the model. As such, our data suggest that crisis-service utilization prior to treatment may best serve as a problem behavior to be targeted in treatment, as opposed to a meaningful sign of risk.

Third, receiving DBT decreased ER visits for psychiatric reasons during the treatment year, which then decreased the number of suicide attempts during follow-up. These results provide preliminary evidence that DBT's practices regarding minimizing the use of crisis-service use may play a large (potentially causal) role in its efficacy in reducing suicidal behaviors. It is quite likely that other elements of DBT could lead to decreased hospitalization (e.g., therapist availability 24/7 to manage suicidal crises without resorting to hospital care, which was not standard to the CTBE condition), and consequently lead to fewer suicide attempts, but such mediational analysis requires further study with much larger sample sizes. Certainly, given that psychiatric hospitalization is associated with the experience of humiliation (Svindseth, Dahl, & Hatling, 2007), stigmatization (Moses, 2011), coercion (Sheehan & Burns, 2011), aggression, and/or violence (Cornaggia, Beghi, Pavone, & Barale, 2011; Soliman & Reza, 2001), it is entirely possible that reducing the use of crisis services might itself lead to fewer suicide attempts. Indirect support for such a hypothesis can be drawn from past research suggesting that case management done with the DBT approach to crisis intervention (which, by definition, minimizes hospitalization) may be as effective as full DBT in reducing suicidal behavior (Linehan, Korslund et al., 2015). It is also possible, of course, that other elements of the DBT crisis-management protocol—including access to the Linehan Risk Assessment and Management Protocol (LRAMP, Linehan, Comtois, & Ward-Ciesielski, 2012), which is a structured tool for risk assessment that also contains suggestions for evidence-based crisis-management strategies—could account for both sets of findings. Given that the CTBE condition from this study did not utilize the DBT crisis management protocol and did not have access to the LRAMP, this possibility cannot be ignored.

Although an examination of the intervention characteristics that resulted in reduced hospitalizations is beyond the scope of this study, we have several hypotheses to forward that warrant consideration. It is possible that increasing global skills use, which statistically mediates reductions in suicidal behavior (Neacsiu et al., 2010), may increase one's behavioral repertoire in a suicidal crisis, thus making one less likely to rely on the use of forms of care like psychiatric ER visits. In addition, research suggests that active problem solving, in which an individual acts with agency in taking steps to solve his or her own problems, may buffer against future suicidal behavior (Linehan, Camper, Chiles, Strosahl, & Shearin, 1987; Linda, Marroquin, & Miranda, 2012; Quinones, Jurska, Fener, & Miranda, 2015). Clients in DBT are taught to be active problem solvers by employing skills for managing, reducing, and surviving the exact types of crisis that have resulted in self-injury and suicidal behavior in the past. It is possible that DBT clients may have engaged in less suicidal behavior in the year following treatment, not only because they engaged in active problem solving to reduce stressors long-term, but also because they engaged in and rehearsed active skill use to cope with emotional crises rather than relying on alternative strategies such as seeking crisis services through hospitalization. Future researchers may attempt to separate out these pathways to further refine DBT.

Several characteristics of the study are important to consider when interpreting the results. Because all participants in our sample met criteria for BPD, the generalizability of our result patterns is unclear. People with pervasive emotion-regulation difficulties and chaotic lives may be especially likely to be unintentionally reinforced by hospitalization, potentially because it provides a break from unrelenting life chaos. Indirect evidence for such a relationship comes from a study that showed patients meeting the criteria for BPD who died by suicide had been hospitalized significantly more frequently than patients meeting criteria for BPD who had not died by suicide (Kullgren, 1988). In addition, because inclusion criteria mandated that participants have at least two suicide attempts or NSSI episodes in the past 5 years and at least one episode of suicidal or nonsuicidal self-injury in the 8 weeks prior to study enrollment, the participants in our sample comprised a particularly high-risk group of individuals. Although this high-risk sample gave us the statistical variation to meaningfully study a low base-rate phenomenon, thus constituting a strength of this study, it also highlighted the possibility that lower-risk samples might not demonstrate the same result patterns. Therefore, it is unknown whether or not the results observed in this study would generalize to other populations without those characteristics, and future studies should include examinations of this possibility. In addition, because these analyses incorporated data from a single RCT investigating a single active treatment, it is unknown whether these result patterns would replicate across numerous investigations of DBT, and it is also unknown whether these result patterns would extend to other treatments. Finally, because the data included total counts of different crisis services accessed during a study period, our analyses were unable to account for the fact that many inpatient admissions were preceded by (and thus correlated with) psychiatric ER visits. Thus, parsing specific effects between inpatient admissions and ER visits with greater confidence will require a more nuanced research design tailored to these analytic questions. In addition, comparing relationships between suicidal behavior and more specific forms of hospital/crisis care may prove useful in hypothesis generation going forward. It is possible that ER visits for psychiatric reasons, like inpatient admissions, may serve to reinforce suicidal communication or provide temporary relief from chaotic life stress, but without research comparing the effects of ER visits for psychiatric reasons with voluntary inpatient admissions and involuntary inpatient admissions, such mechanistic understandings of the relationships will remain unclear. Future research should seek to replicate these findings and address these limitations.

More research is clearly needed in this area of inquiry. Specifically, although we were able to statistically model several key variables that could potentially serve as confounds in the relation-

ship between crisis-service utilization and suicidal behavior in the year following treatment, other previously identified predictors of suicidal behavior warrant similar exploration. For instance, our sample was mostly lower socioeconomic status (SES) and did not graduate college, whereas a recent study found that higher SES and more education was associated with greater risk of postdischarge suicide (Pirkola, Sohlman, & Wohlbeck, 2005). In addition, our sample was mostly Caucasian and entirely female, and we were unable to model for variables like sexual orientation, even though prior research has shown that ethnicity, sex assigned at birth, gender identity, and sexual orientation are all meaningful demographic predictors of suicidal behavior (Centers for Disease Control & Prevention, 2015; Grossman & D'Augelli, 2007; Kann et al., 2011), so studies with samples containing sufficient variability in these domains will prove immensely valuable. Other variables related to psychiatric risk more broadly—including but not limited to the presence of bipolar disorder and/or psychosis, which were exclusion criteria for participants in this study—should also be investigated as potentially meaningful confounds in the relationship between crisis-care utilization and suicidal behavior.

Finally, it must be emphasized that, although data for this study came from an RCT of DBT for highly suicidal individuals, the randomization employed was not designed to eliminate all potential confounds for the specific relationship between treatment-year crisis-service use and suicidal behavior in the year following treatment. Such a study would require the randomization of the delivery of crisis-service treatment in a sample of individuals deemed at risk for requiring such services, and although this kind of study would be the most scientifically rigorous test of whether psychiatric crisis services are, in fact, iatrogenic, the ethical issues surrounding the design and execution of such a study are of notable concern. That said, a number of specific research directions may yield important contributions to this area of inquiry, even without the gold-standard RCT. For instance, descriptive studies investigating clinical decision-making in hospital settings for patients recovering from or at high risk for suicidal behavior may prove informative for understanding the observed link between hospitalization and risk for subsequent suicide. Similarly, studies that investigate the trajectories of suicidality between admission to a hospital and the period postdischarge—perhaps with objective behavioral assessments like the implicit association test (IAT; Nock & Banaji, 2007) – may prove useful in hypothesis generation regarding the association between hospitalization and postdischarge suicide risk. Finally, studies that are able to integrate the routine assessment of suicidality—perhaps with real-time assessment using tools like ecological momentary assessment—with data about environmental and social contexts may allow researchers to test hypotheses about the functional relationship between hospitalization and suicidal behavior (e.g., is data consistent with the hypothesis that hospitalization may negatively reinforce suicidal behavior via environmental responses?) Although none of these studies individually would be able to conclusively describe a truly nuanced or full picture of the relationships in question, their empirical value flows emergently from their combination with other inquiries into the relationship between hospitalization and postdischarge suicide risk and the metalevel conclusions drawn from the integration of findings across studies.

The potential clinical implications of this research warrant careful consideration. The findings presented in our study are in line with an emerging literature, described more thoroughly in the introduction, suggesting a strong and reliable association between crisis-care use and subsequent risk for suicide (e.g., Meehan et al., 2006; Sohlman & Lehtinen, 1997). Although our data should not be interpreted to mean that either psychiatric ER visits or inpatient admissions are definitively harmful or harmful in the context of all possible clinical presentations, our results signal the empirical possibility that forms of crisis management like psychiatric ER visits may be iatrogenic for some. If these findings are replicated, then the field of psychology, and indeed the public health sector more broadly, would have to reconcile its reliance on hospital care to mitigate acute suicide risk with data suggesting that such a practice may be harmful. Ignoring this possibility may be ill-advised. As Lilienfeld (2007) articulated nearly a decade ago, psychologists have paid relatively little attention to treatments that have the potential to cause harm. It behooves the field of psychology to address the question as to whether, under which circumstances, and for whom psychiatric crisis services may do harm. In addition, our findings highlight the possibility that DBT's approach to suicide-crisis management, including, but potentially not limited to, the use of structured risk assessment and management tools like the LRAMP, may contain active ingredients in reducing suicidal behavior without resorting to hospital care. If future research provides further support for this hypothesis, then dissemination and implementation efforts should aim to increase therapist access to crisis-management tools and strategies commonly employed in DBT.

In sum, for highly suicidal individuals meeting criteria for BPD, psychiatric crisis-service use (e.g., psychiatric ER visits) may be directly and uniquely predictive of subsequent suicidal behavior. Our results signal the possibility that treatments that minimize the use of psychiatric crisis services—e.g., DBT—may be particularly beneficial to reducing risk for suicide. Further work is sorely needed to inform, expand, qualify, and challenge our understanding of the relation between crisis-services utilization and suicide risk within and outside of the context of DBT.

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