DBT-Accepting the Challenges of Employment and Self-Sufficiency (DBT-ACES) Effectiveness: A Re-Evaluation in Three Settings

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Introduction

Borderline personality disorder (BPD) is considered to be one of the most potentially lethal of all psychiatric illnesses with a prevalence of about 1 -2% in the general population (Bender et al., 2001; Lieb et al., 2004; Zanarini et al., 2012). Skodol, et al., (Skodol et al., 2002) examined several domains of impairment for 175 treatment -seeking individuals with BPD and found severe impairment in employment among 52%, global life satisfaction for 55%, social adjustment for 71%, and overall functioning for 47%, of the sample. Functional impairment was more severe for those with BPD than a comparison sample with major depression.

In a 2012 review (Sansone & Sansone, 2012) of 11 mostly small national and international studies representing the literature on employment in BPD since 1980, severe and long lasting impairment in employment and high rates of disability were reported. In a large US study, Zanarini, Jacoby, Frankenburg, Reich, & Fitzmaurice (2009) sampled 290 individuals with BPD during an inpatient psychiatric admission at McLean Hospital in Massachusetts and followed them for 10 years. Consistently over time, approximately half (41-52%) of the sample was receiving social security disability income (SSDI) disability benefits- three times the rate of the comparison group with other personality disorders.

The opposite of psychiatric disability is recovery. Zanarini, et al., (Zanarini et al., 2012) defined recovery as "remission from BPD, have at least one emotionally sustaining relationship with a close friend or life partner/spouse, and be able to work (including work as a homemaker) or go to school consistently, competently, and on a full-time basis" (p.2). Based on this definition and review of a 16-year follow-up period, rates of recovery for individuals with BPD were substantially lower and unstable compared to controls with other personality disorders. Employment and education outcomes have rarely been evaluated in clinical trials of BPD treatments. However, one large clinical trial evaluating the efficacy of Dialectical Behavior Therapy (DBT) vs. General Psychiatric Management (GPM), found that, at baseline, 40% of participants were working or in school and 40% received psychiatric disability. After a year of treatment and two years follow-up, 58% of the DBT and 40% of GPM participants were working or in school and 29% of DBT and 47% of GPM participants received psychiatric disability, non-significant differences (McMain et al., 2012).

Employment is a struggle for many individuals with BPD. However, this does not mean individuals with BPD do not want to work. Indeed, a qualitative study examining client goals for recovery found that 50% of the sample of clients with BPD identified the importance of practical achievements and employment as part of their recovery, and that making progress in pursuing career goals would lead to an increased sense of competence (Katsakou et al., 2012). These findings are supported by other qualitative studies of individuals with BPD (Cunningham et al., 2004) and psychiatrically disabled individuals with a variety of diagnoses (Killeen & O'Day, 2004; Underlid, 2005) who report a strong desire to work.

In response to clients' desire but inability to work, a team of DBT therapists at Harborview Medical Center in Seattle, WA developed a recovery oriented program for clients that have completed a year of standard DBT (SDBT) called DBT-Accepting the Challenges of Employment and Self-Sufficiency (DBT-ACES). DBT-ACES promotes living wage employment with the goal to reduce clients' dependency on disability payments, social services, family, and others for basic needs. DBT-ACES, like SDBT (Linehan, 1993), is an intensive one-year outpatient program that combines skills training focused on contingency management, skills training, and exposure strategies.

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The feasibility of DBT-ACES was established in an evaluation of 30 consecutive SDBT graduates at the end of 1 year of DBT-ACES and after a 1 year follow-up (Comtois et al., 2010). From the end of SDBT to the end of DBT-ACES, there was a significant improvement in participants' odds of being employed or in school, working at least 20 hours per week, as well as subjective quality of life and sustained decrease in the frequency of psychiatric inpatient admissions. Since this initial evaluation, the Harborview DBT-ACES program has expanded its clientele to include those with commercial as well as public insurance. Also, the Medicaid expansion in Washington State under the U.S. Affordable Care Act increased the number of employed adults with insurance. In addition, two other sites developed DBT-ACES programs: Harbor-University of California Los Angeles (UCLA) Medical Center and Der Landschaftsverband Westfalen-Lippe (The Regional Association of Westphalia-Lippe; LWL) Klinik in Lengerich, Germany. All sites planned and coordinated observational program evaluations with the same outcome variables. The goal of this re-evaluation was to combine these evaluations to determine if initial DBT-ACES results could be replicated. In addition, this evaluation examined program costs, costs of inpatient use, and school and workplace benefits in order to estimate the net monetary benefit of DBT-ACES above and beyond those gained by SDBT alone.

Methods

This program evaluation was conducted at three settings: Harborview Medical Center, Harbor-UCLA Medical Center, and LWL-Klinik Lengerich in Germany. Harborview is a major medical center in downtown Seattle owned by King County and managed by the University of Washington as both the county hospital and a research and training facility. Harbor-UCLA is a major medical center in Torrance, CA that is a UCLA-affiliated county hospital and research and training facility. Both Harborview and Harbor-UCLA include large outpatient community mental health centers with long-standing outpatient DBT programs. LWL-Klinik Lengerich is a psychiatric and neurological specialty hospital in Lengerich, Germany, and the DBT-ACES program existed within a well-established standard DBT program in an ambulatory care clinic.

Participants

This study was conducted as program evaluation of ongoing clinical care in the three DBT programs. Enrollment in SDBT was based on BPD diagnosis on the SCID-II interview (First, 1997; First et al., 1995) in Lengerich, on life-threatening and therapy-interfering behaviors at Harborview, and either SCID II BPD diagnosis or a subthreshold diagnosis if combined with high target behaviors at Harbor-UCLA. Patients with low intelligence level (IQ < 70) were excluded for all programs. Lengerich also excluded clients with acute schizophrenic or manic illness, substance dependence (only in the case of permanent use and a necessary detoxification) and diagnosis of anorexia with BMI < 17.5. Harborview and Harbor-UCLA did not have these exclusions.

The 45 participants were clients consecutively admitted to each program. Data was collected by the teams as program evaluation so there were no research specific inclusion or exclusion criteria nor was a power analysis conducted. All sites have active SDBT programs from which pool clients for this study were drawn. Harborview included 21 participants consecutively entering the Harborview DBT-ACES program between 2011 and 2013. Harbor-UCLA included 8 clients consecutively entering the Harbor-UCLA DBT-ACES program between 2011 and 2016. LWL-Klinik Lengerich included 16 participants consecutively entering the Lengerich DBT-ACES program between 2010 and 2012. The 45 DBT-ACES participants represent only a subset of the clients in SDBT at the 3 sites: 24% of those starting SDBT entered DBT-ACES at Harborview, 22% at Harbor-UCLA, and 50% at Lengerich.

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DBT-Accepting the Challenges of Employment and Self-Sufficiency (DBT-ACES)

DBT-ACES is a manualized adaptation of standard DBT developed by the Harborview DBT program in collaboration DBT treatment developer, Marsha Linehan, PhD (Comtois et al., 2010; Hoeschel et al., 2011). The treatment is the same as comprehensive standard DBT, consisting of the same philosophy and strategies as well as individual, group, out-of-session contact, and consultation team modalities, but includes four modifications: pre-treatment, primary targets, specific career and employment contingencies, and the DBT-ACES skills curriculum. It is currently designed to occur when a client is near graduation from a full year of SDBT or after having completed that year.

Pre-treatment in DBT-ACES is a 2-4 month process during which a potential client is oriented to DBT-ACES through a process designed to mimic application processes for competitive employment (e.g., performance evaluation and interview) and college (e.g., entrance exams and short essays). The pre-treatment process provides valuable exercises through which clients develop career plans and use their SDBT skills to address barriers to competitive employment or college, including stopping self-harm and other significant behavioral dyscontrol.

DBT-ACES primary targets are called Recovery Goals and were developed by the DBT-ACES team in consultation with Marsha Linehan, PhD. The 30 Recovery Goals include career and living wage employment goals as well as goals for interpersonal and emotional skillfulness and for self-sufficiency. These goals are the focus of individual DBT-ACES sessions, serving as the primary quality of life targets within the DBT hierarchy.

The third modification of DBT-ACES is the addition of two graduated contingencies to facilitate living wage employment: "Career Activities" and "Work as Therapy." The Career Activities requirement is tied directly to the client's ambitions for living wage employment and reflects the most effective activities to achieve them. This can include paid employment, college, vocational training, internships, self-employment, etc. The contingency of Career Activities starts at 10 hours a week and increases to 20 hours by 8 months into DBT-ACES. To assure DBT-ACES clients have the skills to (a) find a job quickly and (b) keep a job even if they don't like it (a requirement of life off disability), the Work as Therapy contingency requires clients to find a standard job on the open market and work there for a minimum of 10 hours/week for at least 6 months. Both contingencies are requirements for continued participation in DBT-ACES. If they are not met for 4 weeks in a row, the client is suspended from the program (i.e., on DBT 'therapy vacation') until they are met. (Work as Therapy counts toward Career Activities so the maximum time required is 20 hours/week.)

The fourth modification is a DBT-ACES skills curriculum that was developed with a focus on the key skills and strategies for successful employment and self-sufficiency including goal-setting, problem-solving, troubleshooting, perfectionism, time management, and reinforcement of themselves and others.

DBT-ACES uses all SDBT strategies, with a strong focus on contingency management and exposure. Contingency management is reflected in the work requirements described above as well as constant attention to reinforcing adaptive behavior and teaching clients to do so for themselves. Anxiety and shame are predominant emotions that interfere with returning to work and functioning self-sufficiently, based on an assessment of DBT-ACES applicants' self-reported barriers to achieving these goals (Carmel et al., 2018). Therefore, exposure is a dominant treatment strategy in DBT-ACES – primarily in vivo as well as in-session informal exposure. (Detailed information on the DBT-ACES program can be found at dbtaces.com.)

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Clients received 1 year of comprehensive SDBT according to the treatment manuals (Linehan, 1993, 2015b, 2015a). All site clinicians were trained in SDBT by Marsha Linehan and expert clinicians that had been offering comprehensive SDBT for many years. Clients interested in participating in DBT-ACES completed DBT-ACES pre-treatment in their final four months of SDBT or after completing the program. Clients started one year of DBT-ACES when their applications were completed and accepted. DBT-ACES was provided according to the treatment manual at all sites as trained by the first author and treatment developer (KAC).

Procedures

For the US sites, the information from this unfunded program evaluation was obtained by a combination of therapist interview and record review by the authors as members of their respective DBT programs. Individual therapists in Lengerich interviewed their clients with standardized interviews translated into German which were then used to determine study outcomes matched to those collected in the US. All participants who entered the DBT-ACES program were included in the outcome analyses regardless of whether they completed DBT-ACES. At Harborview and Harbor-UCLA, this program evaluation was not determined to be research by their university IRB and thus not in need of IRB review. Ethik-Kommission der Ärztekammer Westfalen-Lippe und der Westfälischen Wilhelms-Universität Münster (Ethics committee of the medical chamber Westfalen-Lippe and the Westphalian Wilhelms-University Münster) confirmed the Lengerich evaluation was part of clinical quality control and no need of ethical review.

Measures

Employment and Schooling

Employment includes only competitive employment – that is, a job for pay that is available on the open market for people with or without a disability. School was defined as a matriculated program such as college, General Educational Development (GED) program, or a vocational-technical or business certificate program. As minimum hours of both employment and school are required as part of DBT-ACES participation, this information was well known and tracked by the clients and therapists using the DBT diary cards to monitor hours of employment. Therapists were aware of the need for this information for the program evaluation.

Cost-Benefit Measures

Costs included for the cost-benefit analysis were any associated with inpatient stays that occurred during the 1 year prior to admission to the SDBT program (Pre-SDBT), 1 year after the SDBT program (Pre-ACES) and the 1 year after the DBT-ACES program (Post-ACES). Potential benefits associated with the program were also assessed by valuing (i.e., estimating the monetary value of) hours spent working or in school for each of these time periods. All dollar values were converted to 2015 values using the Consumer Price Index. Missing values were all due to baseline (Pre-SDBT) non-response as opposed to being censored as a result of loss to follow-up. All missing-non-response values pertaining to the number of inpatient stays reported at baseline were assumed to be zero. Also, missing-non-response educational-attainment values reported at baseline were assumed to imply a level of "less than high school." Given the drastic drop in inpatient visits and the increase in hours worked that occurred from pre-SDBT to pre-ACES (see below), the assumptions employed here with regard to number of visits and educational attainment most likely serve to diminish the predicted cost offset associated with the intervention.

Inpatient Stays

Each inpatient stay was valued according to the average 2010 cost for the 18-44 age group reported by the Agency for Healthcare Research and Quality ($9,910) (Pfuntner et al., 2013). This estimate was derived from the Healthcare Cost and Utilization Project

(HCUP) National Inpatient Sample (NIS), which contains information representative of all discharges from U.S. community hospitals, except rehabilitation and long-term acute care hospitals, regardless of payer and has the advantage

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of estimating actual costs incurred by the hospital (as opposed to charges billed).

Workplace and Educational Productivity

Workplace productivity was valued according to the reported number of hours worked and the median weekly earnings associated with the clients' reported level of educational attainment, obtained from the Bureau of Labor Statistics (BLS) (Bureau of Labor Statistics, n.d.-a). Educational benefits were based on the reported number of hours spent in school-related activities, and were valued according to the estimated return for a year of schooling in the United States (Card, 1999), applied to the lifetime earnings for individuals between the ages of 30 and 34 years (Max et al., 2004). For this age group in the United States, a year of education is estimated to increase the present value of lifetime earnings by $61,570. The portion of this total for a DBT-ACES client was estimated by their hours of school activities relative to a standard full-time school year estimated as 145 eight-hour academic days.

As the purpose for the economic evaluation was to inform "real-world" decisions, generalizable unit cost estimates were used instead of real costs for the specific programs. The average annual cost of the SDBT and DBT-ACES programs was estimated using a modified version of the Drug Abuse Treatment Cost Analysis Program Instrument (DATCAP)(French, 2003; French et al., 1997). The DATCAP is a widely-used, customizable instrument used to estimate the resources required to deliver a program. A unit costing method was used to assign values to these resources. The costs associated with the DBT programs included the cost of a licensed psychiatrist at 20% FTE and four mental-health practitioners (one at 60% FTE and three at 80% FTE); computers, furniture and office space for each individual; a printer; and miscellaneous supplies and materials. In the interest of generalizability, mean salary and benefit information for SDBT/ACES personnel was obtained from the BLS (Bureau of Labor Statistics, n.d.-b). The per-client annual cost of the program was estimated at $10,872.

Data analysis

Data were collected for three time points – the beginning of SDBT (Pre-SDBT), the beginning of DBT-ACES (when the individual had completed 1 year of SDBT; Pre-ACES), and the end of DBT–ACES (Post-ACES). Longitudinal data analysis was conducted using generalized estimating equation (GEE) which appropriately models clustered data, can accommodate non-normal outcome distributions, and leverages outcome data from all individuals including those with partial follow-up data. The outcome variables were (1) hours of competitive employment plus enrollment in school and (2) working or attending school at least 20 hours per week. Gaussian and binomial GEE models were used for continuous and binary outcome variables, respectively. Each outcome variable was regressed on site and time in separate GEE models. The site variable was divided into two simple contrasts using Harborview as a reference group: i) UCLA-Harbor vs. Harborview and (ii) Lengerich vs. Harborview. The time variable was divided into two planned contrasts: (a) Pre-ACES versus Pre-SDBT and (b) Post-ACES versus Pre-ACES.

For the Gaussian GEE model of the hours of employment outcome, which was non-normally distributed, a sensitivity test was conducted using the rank-transformed outcome in order to provide a non-parametric test of statistical significance (Fan & Zhang, 2017). The *P* values derived from the rank GEE analyses were consistent at $p < .01$ with those derived from a Gaussian GEE approach. Consequently, the effect sizes from the results assuming normal distribution are reported for ease of interpretation. Other possible confounders such as age and presence/absence of BPD diagnosis, which appeared to differ between sites, were included in the sensitivity analyses. Results were consistent with these covariates so they were not included in the analyses reported here. GEE was conducted using the *gee* and *aod* packages in R (Carey et al., 2015; Lesnoff & Lancelot, 2012; R Core Team, 2014).

The authors conducted a preliminary analysis of the costs and cost-offsets associated with DBT-ACES relative to SDBT. The person-period was modeled using individual multivariable generalized linear models (GLM) for each resource category; that is,

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inpatient costs, and workplace and educational benefits. In the DBT-ACES study period, there was only missing work and school data for two participants who had dropped out. The missing data was accounted for using inverse probability weighting in the GLM regressions (Seaman & White, 2013). Standard errors and p-values were calculated using non-parametric bootstrapping techniques to help control for sampling uncertainty (Glick et al., 2007).

Results

Demographic and clinical characteristics of the three samples are provided in Table 1. The Harbor-UCLA sample had a higher mean age (M = 42) as compared to Lengerich (M = 27) and Harborview (M = 34). Not all participants graduated the DBT-ACES program (although all are included in the results presented). Dropout was highest at Harborview (n=8, 38.1%) then Harbor-UCLA (n=2, 25%) and lowest in Germany (n=1, 6.3%).

Table 1 Demographic and Clinical Characteristics

	UW-Harborview (N = 21)		Harbor-UCLA (N = 8)		Klinik Lengerich (N = 16)	
Age						
Mean	34.1		42.5		26.9	
SD	9.3		10.8		10.6	
	N	%	N	%	N	%
Female	20	95.2	8	100.0	14	87.5
Ethnicity						
White	17	81.0	6	75.0	16	100.0
Black	0	0	1	12.5	0	0
Latino/a	1	4.8	1	12.5	0	0
Asian-Pacific Islander	0	0	0	0	0	0
Mixed	3	14.3	0	0	0	0
Highest Education						
Some high school or less	2	9.5	2	25.0	2	12.5
High school or GED	5	23.8	2	25.0	7	43.8
Some college	6	28.6	1	12.5	1	6.3
College graduate	6	28.6	2	25.0	6	37.5
Post-graduate education	2	9.5	1	12.5	0	0
Marital status						
Single, never married	16	76.2	7	87.5	12	75.0
Married	1	4.8	1	12.5	3	18.8
Divorced or separated	3	14.3	0	0	1	6.3
Homeless	2	9.5	0	0	0	0
Borderline personality disorder diagnosis	20	95.2	8	100.0	16	100.0
Primary Axis I diagnosis						
Depressive disorder	15	71.4	6	75.0	13	81.3
Anxiety disorder	5	23.8	2	25.0	1	6.3
Comorbid Axis I diagnoses						
Mean	2.4		1.2		1.	
SD	.97		1.0		1.08	

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Workplace and Educational Outcomes

Figure 1 illustrates the results of this study. Hours of work or school increased over time, from an average of 5.8 hours/week at Pre-SDBT to 13.7 at Pre-ACES and 30.3 hours/week at Post-ACES. The percent of clients competitively employed or enrolled in school at least 20 hours/week was at 15.6% (n=7) at Pre-SDBT and increased to 33.3% (n=15) at Pre-ACES and to 83.7% (n=38) at Post-ACES.

Figure 1 Examination of DBT-ACES Outcomes by Setting

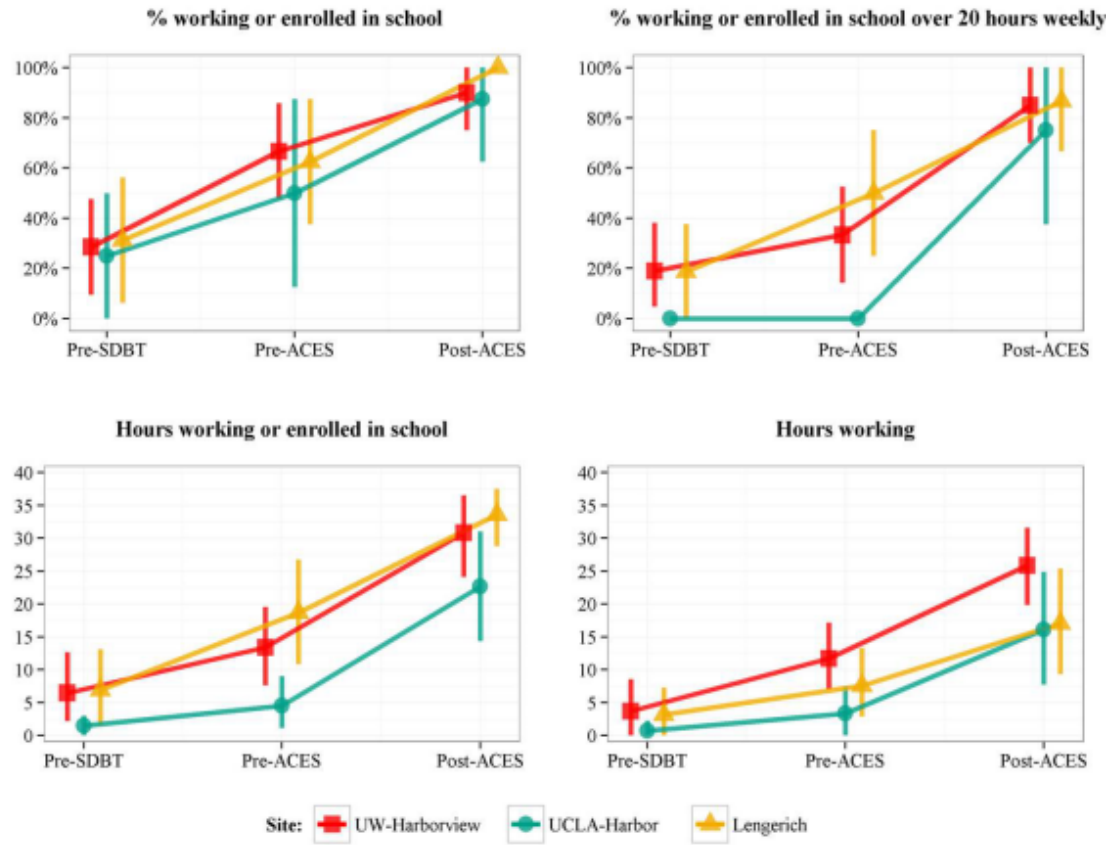

Figure 1 and Table 2 illustrate employment and school descriptive information for each setting and at each time point. Comparing the sites, clients at Harbor-UCLA were slower to engage in work and school and rarely did so during SDBT (i.e., before DBT-ACES) in comparison to clients at Harborview and Lengerich. It is also apparent that clients in the new clinics were more likely to attend school than Harborview clients.

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Table 2 Examination of DBT-ACES outcomes by setting

	UW-Harborview			Harbor-UCLA			Klinik Lengerich		
	Pre-SDBT	Pre-ACES	Post-ACES	Pre-SDBT	Pre-ACES	Post-ACES	Pre-SDBT	Pre-ACES	Post-ACES
Competitive Employment									
% Any	14.3%	61.9%	85%	12.5%	25%	75%	18.8%	37.5%	66.7%
% Greater than 20 hours/week	9.5%	28.6%	80%	0	0	37.5%	6.3%	18.8%	46.7%
Hours/week									
Mean	3.7	11.7	25.9	0.8	3.4	16.1	3.2	7.6	17.1
SD	10.7	12.9	14.5	2.1	6.3	13.2	8.3	11.3	15.8
Matriculated Education									
% Enrolled	14.3%	9.5%	20%	12.5%	25%	75%	18.8%	43.8%	53.3%
Hours/week									
Mean	2.8	1.7	5.0	0.8	1.1	6.5	3.8	11.1	16.5
SD	7.8	6.6	10.5	2.1	2.2	4.3	9.2	15.2	18.0
Employment or School									
% Any	28.6%	66.7%	90%	25%	50%	87.5%	31.3%	62.5%	100%
% Greater than 20 hours/week	19%	33.3%	85%	0	0	75%	18.8%	50%	86.7%
Hours/week									
Mean	6.5	13.4	30.9	1.5	4.5	22.6	6.9	18.7	33.6
SD	12.3	14.3	14.0	2.8	6.0	12.9	12.6	17.4	9.1

Figure 1 illustrates the results for hours of competitive employment plus enrollment in school. Controlling for differences by setting, clients increased their time engaged in employment or school by 7.96 hours/week between the beginning and end of SDBT (Pre-SDBT to Pre-ACES) ($Z = -2.97$, $p = .003$). Controlling for differences by setting, clients increased their time in competitive employment or enrolled in school by 16.65 hours/week between the beginning and end of DBT-ACES (Pre-ACES to Post-ACES) ($Z = 6.02$, $p < .001$).

One of the biggest differences between the SDBT and DBT-ACES is whether clients achieved at least 20 hours per week of competitive employment and school enrollment (as can be seen in Table 2 and Figure 1). Controlling for differences by setting, clients were 63% less likely to be working or attending school at least 20 hours per week at the beginning of SDBT than at the start of DBT-ACES (Relative Risk [RR]=0.37, 95% CI: 0.18-0.75). Controlling for differences by setting, clients were 11.6 times more likely to be working or attending school over 20 hours per week at the end compared to beginning of DBT-ACES (RR=11.6, 95% CI: 4.78-28.30).

Cost-Benefit Outcomes

Tables 3 and 4 contain descriptive statistics for the cost-benefit measures obtained at each time point, as well as the

associated raw and predicted cost figures. Inpatient visits fell from an average of 2 measured over the 1 year prior to entering SDBT (pre-SDBT), to an average of 0.05 after SDBT (Pre-ACES), which was unchanged for the year after DBT-ACES (Post-ACES). The mean predicted cost differential for the Pre-ACES versus Pre-SDBT period was -$16,491 (SE=6,119; p=0.01); see Table 4. The mean predicted cost differential for Post-ACES versus Pre-SDBT was very similar at -$17,187 (SE=6,281; p=0.01). Thus, the predicted cost differential for the Post-ACES vs Pre-ACES period was statistically insignificant ($-696; SE=392; p=.08), due to no further change in the use of inpatient care during the DBT-ACES year. However, the predicted monetary benefit differential for school and workplace benefits during the Post-ACES vs Pre-ACES period was $546 (SE=123; p<0.001) demonstrating that the school and workplace benefits continued to increase.

The estimated increase in value due to reduced inpatient stays and increased school/workforce participation did not significantly offset the estimated per-client cost of the intervention. The per-client cost of the intervention would have to drop to approximately $4,500 before the estimated offset would produce a statistically significant net-monetary benefit.

Table 3. Descriptive Statistics and Costs by Time Period

	Pre-SDBT	Pre-ACES	Post-ACES
Inpatient Visits – Mean (SD)	2 (5)	0.05 (.21)	0.05 (.21)
Hours Worked – Mean (SD)	3 (9)	9 (12)	21 (15)
Hours in School – Mean (SD)	3 (8)	5 (11)	9 (14)
Predicted Inpatient Costs – Mean (SE)	16,649 (6,114)	403 (245)	254 (363)
Predicted School and Workplace Benefits – Mean (SE)	246 (82)	492 (114)	1,038 (131)
Raw Total Cost – Mean (SD)	16,451 (40,443)	-142 (1,901)	-658 (1,775)
Predicted Total Cost – Mean (SE)	16,402 (6,125)	-89 (290)	-784 (386)

Table 4. Predicted Cost Differentials

	Total Costs		Inpatient Costs		School & Workplace Benefits	
	Mean (SE)	P-value	Mean (SE)	P-value	Mean (SE)	P-value
Pre-ACES vs. Pre-SDBT	-16,491 (6,119)	0.01	-16,246 (6,122)	0.01	246 (100)	0.02
Post-ACES vs. Pre-SDBT	-17,187 (6,281)	0.01	-16,395(6,267)	0.01	792 (138)	<0.001
Post-ACES vs. Pre-ACES	-696 (392)	0.08	-149 (351)	0.67	546 (123)	<0.001

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Discussion

This study was an observational evaluation of DBT-ACES in three routine care outpatient settings. Results replicated the earlier findings (Comtois et al., 2010) with somewhat higher rates of employment and school enrollment achieved in the Harborview and Lengerich settings and slightly lower rates at Harbor-UCLA. School enrollment was lower for the Harborview clients than for clients from Harbor-UCLA and Lengerich. There are a variety of potential explanations for this difference. In Lengerich, education is more accessible and affordable compared to the United States. California also has a number of educational programs to assist clients in returning to work, such as the CalWORKs program that funds many clients' treatment at Harbor-UCLA. In contrast, there are no particular supports nor incentives for attending school in Washington State and thus Harborview DBT-ACES clients and therapists likely focused more attention on increasing employment.

Despite these differences, the results are comparable across all sites and with the previous study. Although the rate of drop out in the current study (6.3 - 38.1%) was less than the previous feasibility study (44%), our findings largely replicate those of the earlier study, which found that with adequate support, behaviorally stable clients entered the workforce and enrolled in school at higher rates than in prior naturalistic longitudinal studies of treatment seeking individuals with BPD (Sansone & Sansone, 2012; Zanarini et al., 2009, 2012; Zimmerman et al., 2012). In the clinical trial that examined employment outcomes, 58% of DBT and 40% of GPM participants were working or in school at two year follow-up (McMain et al., 2012), compared to 87.5-100% at the end of DBT-ACES in the current study. While we cannot be sure DBT-ACES caused this effect without a control group, our results indicate that meaningful recovery is feasible and attainable for individuals disabled by BPD who are invested in living wage employment.

The cost-benefit analysis found substantial savings of the program of over $17,000 per client compared to the year prior to SDBT. The cost offset during the SDBT program was primarily driven by the decrease in inpatient stays. However, evidence of significant school and workplace benefits were also observed in both the SDBT and DBT-ACES years compared to the year prior to SDBT with the latter over three times the former.

It is critical to note that, like the original evaluation study (Comtois et al., 2010), these DBT-ACES programs only enroll individuals with BPD who have completed a SDBT program and want to pursue living wage employment. This is deliberate as DBT-ACES is a voluntary program; it is not designed to motivate individuals to want to work if they don't want to, nor to help clients who do not like nor benefit from DBT. That being said, this is a selection bias that must be taken into account when understanding the results. As described above only 24% of Harborview, 22% of Harbor-UCLA, and 50% of Lengerich clients who started SDBT entered DBT-ACES. While some clients had successful employment outcomes in SDBT and therefore had no need for DBT-ACES, many more were uninterested in or did not feel ready to work toward living wage employment, getting off of psychiatric disability or being financially independent.

This re-evaluation of DBT-ACES has several other limitations. First, this information was collected at the American sites from clinicians and medical records rather than by independent assessors with standardized measures. The data collection differences as well as differences in DBT-ACES program size and structure, could have led to variability of the findings. This limitation is offset by the objective nature of the outcome variables which were calculated the same way at each site. Second, this study included no comparison condition and cannot rule out regression to the mean or natural change. Nor can we rule out that the effects are due to a second year of any DBT based intervention. An additional limitation was the lack of data collected to determine the varying extent to which each partici-

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pant utilized the intervention resources. Indeed, we calculated per-participant costs based on the estimated annual cost of operating the program as conducted at the original DBT-ACES site so outcomes cannot be directly generalized to sites with different structures or caseloads.

Despite these limitations, there are several strengths of this evaluation. External validity is high. All three settings implemented DBT-ACES in existing programs using existing funding and staff with no clinical procedures changed for the purposes of this evaluation. The Lengerich and Harbor-UCLA sites received limited training in DBT-ACES and thus developed and conducted their DBT-ACES programs independently. Results from independent sites lend weight to the program effectiveness as these results replicated the original evaluation (Comtois et al., 2010). A clinical trial or other methodology with stronger controls against threats to internal validity is clearly the next step.

The current study provides additional evidence that DBT-ACES may assist clients in terms of increasing both the likelihood and amount of competitive employment as well as school enrollment. Moreover, our results indicate that DBT-ACES programs are capable of generating a large net monetary benefit to insurers and society. Findings yield additional support for the generalizability of DBT-ACES, which was fully implemented in another DBT program in the United States as well as one in Germany. Finally, this replication validates the benefits of work for those with mental health conditions. It provides further hope to individuals with BPD that they can recover not only from the symptoms and crisis of BPD but also become gainfully employed and financially independent.

List of Abbreviations

Abbreviation	Description
DATCAP	Drug Abuse Treatment Cost Analysis Program Instrument
BLS	Bureau of Labor Statistics
BPD	borderline personality disorder
IRB	Institutional Review Board
DBT	Dialectical Behavior Therapy
DBT-ACES	Dialectical Behavior Therapy – Accepting the Challenges of Employment and Self-Sufficiency
GEE	Generalized Estimating Equation
GED	General Educational Development
GLM	Generalized Linear Models
LWL	Der Landschaftsverband Westfalen-Lippe (The Regional Association of Westphalia-Lippe)
SDBT	Standard Dialectical Behavior Therapy (as described in treatment manuals)
SD	Standard Deviation
SE	Standard Error
UCLA	University of California, Los Angeles
WA	Washington State, USA

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