



Behavioral Tech

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Financial Cost-Effectiveness of Dialectical Behavior Therapy (DBT)

Abridged from the original by Roy Krawitz, MBBCH, FRANZCP, MNZAP: *Financial cost-effectiveness of, and other dialectical behavior therapy information, for funders, administrators and providers of services for people with borderline personality disorder*

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Original Abstract:

Objective: To provide relevant financial cost-effectiveness and other dialectical behavior therapy (DBT) information to assist funders, administrators, and providers decision-making about borderline personality disorder (BPD) service provision.

Method: The paper provides a brief overview of BPD; current BPD treatment research; current cost-effectiveness research of DBT and other BPD treatments; clinical and cost-effectiveness relevance of adherent DBT; and final conclusions.

Conclusions: For the future we need more prospective cost-effectiveness research built into research of different treatments across different client populations. However, for now, DBT offers Level 1 (highest level) evidence of efficacy and effectiveness, and is an evidence-based option for treating people with BPD that is likely to meet the objectives of funders, economists, accountants, administrators, providers and consumers.

Key words: borderline personality disorder; dialectical behavior therapy; cost-effectiveness; financial; adherence



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EXECUTIVE SUMMARY

- Borderline Personality Disorder – Size of the problem:
 - Suggestions are that BPD is among the most costly of mental health diagnoses
 - 5.7% of population - in largest (35,000 people), most recent epidemiological study
 - 20% of mental health inpatients
 - 10% of community mental health patients
 - 50% of highest service users
 - 10% suicide rate (50 times that of general population), similar to that of schizophrenia, bipolar disorder
 - Highest risk of suicide (females) and 2nd highest risk of suicide (males) of all mental disorders
 - 33% of suicides shown on psychological post-mortem to have met criteria for BPD
- Meta-analysis is the method of scientific assessment that provides support for the superiority of the evidence for any particular evidence-based practice over alternatives. DBT is the only BPD treatment to date that has sufficient outcome studies to enable a meta-analysis to be carried out.
- DBT has been validated by several authoritative organisations (U.K. government NICE guidelines, SAMHSA report to US Congress, American Psychological Association, Australian Psychological Society,) as meeting the highest ratings of evidence with other treatments having lower evidence ratings
- Cost-effectiveness studies on BPD treatments are in their infancy and variable, so details need to be considered with caution; however, trends are clear that effective treatment reduces costs.
- The majority of reported cost savings are through a reduction **in mental health hospitalization.**
 - Mental health cost ‘savings’ of a new effective service will be substantially determined by existing hospitalization rates.
- DBT is committed to treating clients wherever possible in the community so that clients learn skills (including keeping themselves safe) in their ‘real ‘ world (community)
 - with substantial reductions in hospital days used reported
 - including in six Australasian studies
- Cost savings reported are likely to increase over the years following treatment
- Adding other service costs (police, justice, ambulance, social services, housing) and lost income productivity would further enhance the cost-effectiveness analysis
- Data on cost-effectiveness is somewhat limited; however, for now DBT offers an evidence-based option for treating people with BPD that is likely to meet the objectives of funders, economists, accountants, administrators, providers, and consumers.



DIALECTICAL BEHAVIOR THERAPY: OVERVIEW

DBT is a mindfulness and acceptance-based cognitive-behavioural therapy adapted for treating people with severe complex, hard-to-treat multi-diagnostic conditions, in particular Borderline Personality Disorder (BPD). Standard comprehensive DBT comprises 4 components: individual therapy (approximately 60 minutes/week); group educational skills training (approximately 120 minutes/week); team meeting (approximately 90 minutes/week); and unscheduled telephone calls (average duration approximately 6 minutes) (Limbrunner et al., 2011).

DBT TREATMENT EFFICACY RESEARCH - PROFESSIONAL ORGANIZATIONAL VALIDATION

A number of professional organizations have validated DBT as an empirically supported treatment as summarized in Table 3¹ (below).

Table 3:

- The U.K. government NICE guidelines provide the only specific, favorable naming of a specialist treatment: “For women with BPD, for whom reducing recurrent self-harm is a priority, consider a comprehensive DBT programme” (NICE, 2009).
- The Australian Psychological Society (2010), in their 174 page review of ‘*Evidence-based psychological interventions in the treatment of mental disorders: a literature review*’, lists DBT for BPD as meeting the highest rating of evidence possible (Level I), with schema-focused therapy and transference-focused therapy as moderate (Level II) evidence and with “insufficient evidence to indicate that any of the remaining interventions were effective”.
- DBT is currently the only therapy, apart from psychoeducational multifamily groups, listed as an evidence-based practice for BPD in the U.S. Substance Abuse and Mental Health Service Administration’s (SAMHSA) National Registry of Evidence-Based Programs and Practices report to the US Congress (SAMHSA, 2011).
 - The SAMHSA report states, “DBT has a large empirical base compared with other treatments and is largely considered one of the best, if not the best, treatments for BPD” (SAMHSA, 2011).
- The American Psychological Association’s Society of Clinical Psychology considers DBT to be the only current treatment for BPD that has Level I (highest level) strong evidence for its use (APA Division 12, 2012)
- Cochrane Database of Systematic reviews (recognized as arguably the most authoritative body of research assessment) stated in their “plain language summary” 2012 review of borderline personality disorder that, “DBT is helpful for people with BPD. Effects included a decrease in inappropriate anger, a reduction in self-harm and an improvement in general functioning. There were generally too few studies to allow firm conclusions to be drawn about the value of all other kinds of psychotherapeutic interventions evaluated” (Stoffers et al, 2012).

¹Table numbers are consistent with the original publication.



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Meta-analysis is the method of scientific assessment that provides support for the superiority of the evidence for any particular evidence-based practice over alternatives. DBT is the only BPD treatment to date that has sufficient outcome studies to enable a meta-analysis to be carried out. Two relatively recent meta-analyses of DBT efficacy for BPD have demonstrated effect sizes of 0.58 (Ost, 2008) and of about 0.37-0.51 depending on variables used, which are small to medium effect sizes (Cohen, 1992; Kliem et al, 2010). Binks et al (2006) in another meta-analysis found that DBT for BPD led to a decrease in self-harm,



suicidal ideation, and self-harm. Sneed et al (2012), in 'Handbook of Evidence-Based Practice in Psychology,' write that because DBT has been shown to be efficacious by three independent groups, that it is, "The only treatment meeting criteria for a well-established treatment for BPD" and that DBT has "the

Table 4: Hospital days used reported on in 8 DBT

There have been 8 RCTs of DBT efficacy whose data on hospital days used is reported:

1. Linehan et al (1991): Clients in 12 month DBT used 30.4 hospital days/client less than TAU, and these reductions in hospital days were maintained and improved upon at one-year follow up (Linehan et al, 1993).
2. Linehan et al (1999): RCT with BPD and drug dependence - DBT outperformed TAU clinically. No statistical difference between DBT and TAU in hospital days used during the 12 month treatment and four month follow-up.
3. Koons et al (2001): after 6 months of DBT reduction from 30% to 10% of people admitted to a mental health hospital in the 3-6 month period of treatment compared to the 3 months pre-treatment (TAU 20% to 10%). Hospital days not reported.
4. Linehan et al (2002): DBT outperformed the comparator treatment (12 step + comprehensive validation) of people with BPD and opioid dependence, with one person admitted to hospital during the 12 months of treatment but with no data reported on pre-treatment hospitalization. Mean number of nights in jail was 7.7 for the DBT clients and 18.8 for comparison clients.
5. Linehan et al (2006): DBT outperformed treatment by experts on most measures. In the year of treatment, statistically fewer DBT clients than treatment by experts' clients were admitted to a psychiatric hospital (19.6% vs 48.9%) or admitted to a psychiatric hospital for suicide ideation (9.8% vs 35.6%). There were essentially no differences in admission percentages in the 12 months post treatment. Hospital days and pre-post comparisons not reported.
6. McMains et al (2009): DBT and comparison - general psychiatric management equally effective across most measures, including hospital days used. In the DBT arm, there was a reduction in days in hospital/client in the last 4 months of a 12 month treatment, compared to the 4 months pre-treatment (10.52 days to 3.73 days).
7. Carter et al (2010) demonstrated a 33% reduction in admission to a psychiatric hospital in DBT compared to TAU. Hospital days not reported; no statistically significant differences found across groups.
8. Feigenbaum et al (2012): No between or within group changes in hospitalization noted.



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most consistent support in reducing suicidality and parasuicidity”. Most recently, Stoffers et al. (2012) found that DBT had “the best meta-analytic evidence for its efficacy” compared to other leading BPD treatments.

Table 5: Reductions in hospital days in Australasian DBT studies (DBT therapists not rated for adherence)

1. Batcheler (2005) reported on a pre-post study of DBT in an otherwise routine New Zealand public mental health service, with a reduction in hospital days used (25.04 to 4 to 1.09 days) comparing the 12 months pre-treatment, the 12 months of DBT treatment, and 12 months post-DBT treatment.
2. Brassington and Krawitz (2006) reported on a pre-post study of DBT in an otherwise routine New Zealand public mental health service, with a reduction in hospital days used (3.42 to 1.2 days) comparing the 6 months pre-treatment with the 6 months of DBT treatment.
3. Prendergast and McCausland (2007) reported on an otherwise routine Australian (Queensland) public mental health service reduction in hospital days used during 6 months DBT treatment compared to the 6 months pre-treatment (6.09 to 1.73 days).
4. Williams et al (2010): 20-week DBT skills group resulted in significant decrease in inpatient days during treatment (2.79 to 0.57 days) with “high service utilisers” having greatest reductions (16.18 to 1.36 days) that was sustained over the 6 months of post-treatment follow-up (17.56 to 3.33 days; $p=.06$).
5. Carter et al (2010): 6-month RCT - DBT resulted in a non-significant but greater reduction in hospitalizations vs. TAU (0.61 vs. 0.91 psychiatric admissions/client in 6 month treatment; 0.5 vs. 1.4 general hospital admissions in 6 month treatment).
6. Pasieczny and Connor (2011): 6-month DBT clients in an Australian public mental health service experienced significant reduction in hospital days used vs. waitlist, TAU comparator treatment

COST-EFFECTIVENESS

Cost-effectiveness studies in BPD treatments are in their infancy and variable, so details need to be considered with caution. Problems include paucity of studies; studies in different jurisdictions with different costs (including different countries) not necessarily comparable; and studies published in different years, not necessarily comparable, even when compounding inflation taken into account. Currency differences, which have and will continue to fluctuate, mean that inter-country cost comparisons are not necessarily entirely valid. Having said all this, funders and administrators still have to make decisions on the best current information available.

Cost-effectiveness: Treatment models other than DBT



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Brazier et al (2006) published a 157 page systematic review of the economics of BPD treatments that at the time did not support statistical significant cost-effectiveness of any particular psychological treatment, however the authors reported that DBT had the “potential to be cost-effective” as did mentalization-based therapy.



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Table 6: Cost-effectiveness of DBT as reported in financial terms

- The American Psychiatric Association (1998) reported treatment costs decreased by US \$26,000/patient in the year of DBT, compared to the year pre-treatment (US \$46,000 to US \$20,000); reductions of 77% in hospitalization days; 76 % in partial hospitalization days; 56 % in crisis beds; and 80 % in ER contacts.
- Linehan and Heard (1999): Linehan et al's (1991) report that DBT treatment resulted in a cost savings of US \$9,000 compared to TAU. Brazier (2006), in a 157 page systematic review report, "This was a good-quality study that scored highly on the *BMJ* checklist for economic evaluations".
- A Swedish (Perseus, 2004) study showed US \$17,000 less costs (320,000SEK vs 210SEK) comparing costs year pre-DBT vs. year of DBT (6-18 month period of DBT). Comparing the month before DBT treatment with the 18th month of DBT treatment demonstrated cost savings of US \$6,000/patient (US \$8,000 vs. US \$2,000) (1SEK = 0.1494 US\$).
- Washington State Institute for Public Policy report (2004) that a Washington State juvenile offender institution DBT program achieved a US \$38.05 financial benefit for every dollar spent on the DBT program, and a benefits minus costs of US \$31,243/client after costs of DBT subtracted (2003 US\$ figures).
- Prendergast and McCausland (2007), in an Australian public mental health service pre-post study: Reduced hospitalization rates resulted in a pre-post treatment cost reduction of A \$4,501/client over 6 months of DBT.
- Pasiieczny and Connor (2011), in an Australian public mental health service study: Decreased treatment costs of A \$5,927/patient over 6 month DBT vs. TAU (Total cost A \$12,196 vs. A \$18,123).
- Amner (2012), in a Welsh public mental health service study: Reduction in all health care costs of 1,741 British pounds at DBT 1 year follow-up, compared with the 12 months pre-treatment in a prospective study, with a 20% reduction in inpatient costs.
- In a 'real world' UK national health service, total costs were higher in the DBT (5,685 GBP) vs. TAU (3,754 GBP) for every 2 months of treatment. DBT outperformed TAU with a 9% reduction in self-harm compared to TAU for every two months of treatment. This 9% reduction therefore costs 322 GBP more than TAU; put differently, it costs 36GBP to achieve a 1% reduction in self-harm (Priebe et al, 2012).

Cost-effectiveness: DBT: Reductions in hospital days in all DBT RCTs

Given that the majority of cost savings are through a reduction in mental health hospitalisation, this section focuses on hospital days as a proxy of cost-effectiveness. For financial context, Pasiieczny (2011) reported a mean cost of a hospital day as 953 Australian dollars and Amner in 2012 of 288 British pounds. Taking inflation and 2012 currency rates (as of 31 October 2012) into account, this translates in 2012 figures into (Pasiieczny US \$1,011; Amner US \$463).



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As stated before, the majority of reported cost savings are through a reduction in mental health hospitalization. DBT is committed to treating clients wherever possible in the community so that clients learn skills (including keeping themselves safe) in their 'real' world (community), with substantial reductions in hospital days used reported, including in six Australasian studies.

Cost-effectiveness of DBT as reported in financial terms

It is reasonable to expect cost savings to increase over the years following treatment as positive client outcomes mean that health cost savings remain, whilst treatment costs of providing treatment decrease or stop. Most of the studies only reported direct mental health costs, meaning that other health costs, costs of other services (police, justice, ambulance, social services, housing), and lost income productivity would further enhance the cost-effectiveness analysis. More research is needed on the long-term cost savings of DBT as compared to other treatments.

Looking to the future, there is preliminary research on more cost-effective ways of delivering DBT without negatively impacting on clinical outcomes: For example, in a pre-post study Andion et al (2012) reported that 1-hour/client/week therapist time was as effective as 1.5-hours/client/week by providing individual skills training in the usual allotted individual therapy time, compared to a separate additional group as delivered in standard comprehensive DBT. This would represent a 12.5% saving of therapist time, given the estimation that one DBT provider allocates 4 hours/client/week, including all activities such as consultation meeting, supervision, telephone calls, paperwork etc.



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Cost of treatment across 4 studies: Table 7 provides cost of treatment for funders who might want to know comparative costs across these four different treatments; however; it is the opinion of the author that these results are confounding. For reasons outlined earlier -- of variability and paucity of studies, different jurisdictions costs, different country costs, currency differences, and time of reporting -- the author believes that decision-makers should be cautious in how this influences decision-making. In addition, the data below for mentalization-based therapy are for partial hospitalisation. A subsequent RCT of out-patient mentalization-based therapy, which would presumably involve lower costs, has not yet reported on costs involved.

Table 7: Costs of treatment model only across 4 treatments

Studies ranged from 6 months to three years, so costs are extrapolated to 12 months of treatment, expressed in US\$ on basis of currency conversions as of 31 October, 2012, and compounded inflation adjusted to 2012 US\$ amounts on the assumption of inflation of 3%/year.

Cost of 12 months of treatment model in US\$ in 2012 (assuming inflation of 3%/year):

MBT - partial hospitalization	UK	20,755	(Bateman & Fonagy, 2003)
TFP	Netherlands	5,276	(van Asselt et al, 2008)
SFT	Netherlands	6,343	(van Asselt et al, 2008)
DBT	Australia	14,412	(Pasiieczny & Connor, 2011)
DBT	Wales	7, 543	(Amner, 2012)



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ADHERENCE RESEARCH: CLINICAL AND FINANCIAL OUTCOMES & IMPLICATIONS

DBT adherence

Research on the efficacy of DBT has been achieved with clinicians meeting a required standard of proficiency and competence in DBT practice (referred to as DBT adherence)-important for client, clinician, organisational and financial outcomes. Yet, the Substance Abuse and Mental Health Administration (2011) reported to the US Congress of widespread concerns of clinicians purporting to be offering DBT that lacked adherence, achieving poorer outcomes than that attained in the research. As of 2012, DBT standards are in development for real-world contexts (outside research units) with formal DBT therapist certification and DBT program accreditation pathways being put in place to independently assess therapist and program proficiencies and adherence to the DBT model.

Adherence, risk, and legal liability

Extensive gold standard research of DBT's effectiveness in working with complex, highly suicidal people is based on adherent DBT; so, if clinicians and organizations want to provide the treatment with reference to the evidence base, DBT adherence is required. "Adapting (rather than adopting) DBT can heighten risk and legal liability" (Koerner et al, 2007). Practicing adherent DBT, "is likely to be more credible than trying to justify an untested modification of DBT" (Koerner et al, 2007).

CONCLUSIONS

For the future, we need a range of different efficacious and effective BPD treatments so as to be able to best match each unique client and treatment modality and to have another treatment to offer those clients where a previous treatment has been unsuccessful. We also need more head-to-head studies across a range of different client groups, and we need more prospective cost-effectiveness studies built into all these studies. Data on cost-effectiveness is variable and somewhat limited; however, at the current time, DBT offers an evidence-based option for treating people with BPD that is likely to meet the objectives of funders, economists, accountants, administrators, providers, and consumers.

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