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Day Hospital versus Intensive Outpatient Mentalization-Based Treatment for borderline personality disorder: A multicentre randomized clinical trial

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Abstract

Background: Two types of Mentalization-Based Treatment (MBT) have been developed and empirically evaluated for borderline personality disorder (BPD): Day Hospital MBT (MBT-DH) and Intensive Outpatient MBT (MBT-IOP). No trial has yet compared their efficacy.

Aims. To compare the efficacy of MBT-DH and MBT-IOP 18 months after start of treatment. MBT-DH was hypothesized to be superior to MBT-IOP because of its higher treatment intensity.

Method. In a multicentre randomized controlled trial conducted at three sites in the Netherlands, BPD patients were randomly assigned to MBT-DH (n=70) or MBT-IOP (n=44). The primary outcome was symptom severity (Brief Symptom Inventory). Secondary outcome measures included borderline symptomatology, personality functioning, interpersonal functioning, quality of life and self-harm. Patients were assessed every six months from baseline to 18 months after start of treatment. Data were analysed using multilevel modelling based on intention-to-treat principles.

Results. Significant improvements were found on all outcome measures, with moderate to very large effect sizes for both groups. MBT-DH was not superior to MBT-IOP on the primary outcome measure, but MBT-DH showed a clear tendency towards superiority on secondary outcomes.

Conclusions. Although MBT-DH was not superior to MBT-IOP on the primary outcome measure despite its greater treatment intensity, MBT-DH showed a tendency to be more effective on secondary outcomes, particularly in terms of relational functioning. Patients in MBT-DH and MBT-IOP thus seem to follow different trajectories of change, which may have important implications for clinical decision-making. Longer-term follow-up and cost-effectiveness considerations may ultimately determine the optimal intensity of specialized treatments such as MBT for BPD patients.

Declaration of interest. P.L. and D.B. have been involved in the training and dissemination of MBT.

Introduction

Borderline personality disorder (BPD) is a highly prevalent mental disorder that is associated with a high socioeconomic burden (1). Psychotherapy is the treatment of choice for BPD patients (2-4). Mentalization-Based Treatment (MBT, 5) is one of the empirically validated psychotherapies for BPD. MBT is based on the assumption that key features of BPD, such as impulsivity, affect dysregulation, and problems in interpersonal relationships, are related to impairments in mentalizing, that is, the ability to understand the actions of other people and oneself in terms of mental states (e.g., needs, thoughts, feelings, wishes, and desires) (5). The main goal of MBT is to help patients develop robust mentalizing skills within everyday interpersonal interactions, to improve affect regulation and interpersonal functioning.

Two types of MBT for BPD have been developed and evaluated in randomized controlled trials (RCTs) and naturalistic outcome studies: Day Hospital MBT (MBT-DH; 6, 7-10) and Intensive Outpatient MBT (MBT-IOP; 11, 12-14). MBT-DH and MBT-IOP are identical in length (with a maximum duration of 18 months) and consist of the same number of individual treatment sessions, but they differ markedly in the frequency of group psychotherapy (Table 1). Given the large differences in the intensity and thus costs of the two treatment programmes, there is an urgent need for studies directly comparing them. A direct head-to-head comparison of MBT-DH and MBT-IOP has not yet been conducted. The current study was designed to fill this gap. We present treatment outcome results 18 months after start of treatment of a multicentre RCT comparing MBT-DH and MBT-IOP in BPD patients. We hypothesized that patients in both treatment programmes would show significant improvements on primary and secondary outcomes. Because of its greater treatment intensity, MBT-DH was expected to be superior to MBT-IOP (defined in terms of a between-group difference of Cohen's $d{\geq}0.5$) on the primary outcome of symptom severity at 18 months as measured with the Brief Symptom Inventory (BSI; 15, 16). Secondary outcomes included measures of borderline symptomatology, personality functioning, interpersonal functioning, quality of life, and self-harm.

[Insert Table 1]

Method

This study was approved by the Medical Ethical Committee of Erasmus Medical Center, Rotterdam, the Netherlands (NL38571.078.12). The design of the study has been described in detail elsewhere (1). Inclusion criteria were (a) BPD diagnosis, (b) age ≥18 years, (c) adequate mastery of the Dutch language, and (d) travel time to the MBT ward of <1 hour. Exclusion criteria were (a) a diagnosis of autism spectrum disorder, chronic psychotic disorder, or organic brain disorder that interferes significantly with the ability to mentalize; (b) intellectual disability (IQ <80); or (c) a diagnosis of antisocial personality disorder with a history of physical violence. Because of ethical considerations, patients who had a stable job for at least 2 years for a minimum of 15 hours a week and/or were primary caregivers of children under 4 years of age could agree to either be randomized into the study or enter MBT-IOP directly, in which case they were excluded from the trial. After providing written informed consent, patients were assessed for symptom and personality disorders using the Structured Clinical Interview for DSM-IV Axis I and Axis II disorders (SCID-I, SCID-II; 17, 18), administered by trained MSc-level psychologists. Patients who were excluded or refused to participate in the trial were ideally referred to an alternative evidence-based treatment delivered within the participating sites. Participating patients were then randomly allocated to either MBT-DH or MBT-IOP by an independent researcher, based on a 1:1 computerized randomization algorithm. However, because of insufficient capacity to provide alternative treatments within the treatment sites, patients who refused participation in the trial had to be allocated to MBT-IOP more often than anticipated. This consumed part of the IOP trial capacity and we subsequently decided to adjust the randomization algorithm in agreement with the Trial Steering Committee, taking into account available treatment places to prevent ethically unacceptable long waiting periods while assuring random allocation. Yet, this still resulted in a skewed randomization between the treatments. However, the average waiting period before starting both treatments was 4.3 months (SD = 2.4 months), and was not significantly different between the two treatment groups. Two sites that had originally intended to participate in the trial were excluded because they were unable to implement MBT in a timely fashion, resulting in the recruitment of patients at three treatment sites (de Viersprong Amsterdam, de Viersprong Bergen op Zoom, and the Netherlands Psychoanalytic Institute). Recruited patients completed an assessment battery before randomization, at the start of treatment, and at 6-month intervals up to 36 months after the start of treatment.

Treatment interventions

MBT focuses on improving BPD patients' capacity for mentalizing (19). Mentalizing is thought to play a key role in affect regulation and interpersonal relationships (5, 20, 21). Treatment components and features in MBT-DH and MBT-IOP are generally very similar (see Table 1), but the intensity of group therapy differs markedly: MBT-IOP involves two group therapy sessions per week, while MBT-DH entails a day hospital programme five days per week, with nine group therapy sessions per week.

Both MBT-DH and MBT-IOP were offered by therapists who had completed MBT training and received ongoing supervision in MBT. The three participating treatment sites had also successfully implemented MBT following criteria set out in the MBT quality manual (21), including monitoring of adherence in daily practice by means of internal and external team supervision. To assess within-session adherence to the model, three trained raters independently rated 20 randomly sampled taped treatment sessions (stratified for condition, setting, and treatment duration) using the MBT Adherence Scale (22). Inter-rater reliability across the 20 tapes was high, with an average intraclass correlation coefficient of 0.87–0.99 for the subdomains and 0.94 for the total adherence score. Only one session was rated as "non-adherent" to the MBT model. The average total adherence score was 3.0 (SD=1.2) on a scale ranging from –3 to 9. Of all sessions, 42% were rated as "above adequate MBT", represented by a total score >3.5. No significant differences were found between conditions and treatment sites in terms of adherence.

Outcome measures

The primary outcome measure was symptom severity as assessed by the Global Severity Index (GSI) of the BSI (15, 16). Secondary outcomes included (a) severity of borderline symptoms as measured with the Personality Assessment Inventory (PAI-BOR; 23); (b) personality functioning as assessed by the Severity Indices of Personality Problems (SIPP; 24, 25); (c) interpersonal problems as measured by the Inventory of Interpersonal Problems (IIP; 26, 27); (d) quality of life as assessed by the Dutch-language version of the EuroQol (EQ-5D; 28); and (e) frequency of suicide attempts and self-harm as assessed by the Suicide and Self-Harm Inventory (SSHI; 19).

The a priori power analysis was based on the GSI. With n=45 patients in each treatment arm, a superiority margin of $d{\geq}0.50$ could be detected with one-sided testing, α=0.05, and 0.80 power (1).

Statistical analyses

Differences in demographic and clinical features at baseline were investigated using two-tailed chi-square tests and independent sample *t*-tests, as appropriate. Treatment outcomes were examined over time using multilevel modelling in order to deal with the dependency of repeated measures within subjects over time and missing data in longitudinal follow-up using the XTMIXED procedure of Stata Statistical Software Release 12. All outcome analyses were based on intention-to-treat principles. Time points were coded −3, −2, −1, and 0, implying that regression coefficients involving time measured the rate of change from baseline to 18 months after start of treatment and regression intercepts referenced group differences at the last time point. SSHI scores were log-transformed as they were highly positively skewed. Maximum likelihood was used to assess whether random or fixed slopes should be assumed in models for each outcome variable. Subsequently, quadratic and cubic time variables were added to the model if likelihood ratio tests showed significant improvement in fit. Estimates and Cohen's *d* effect sizes (29) are based on predicted values.

There was a substantial proportion of missing data (range 12–52%), which was evenly distributed across the conditions. Although multilevel modelling is quite robust in dealing with missing data, we re-ran all analyses using state-of the-art data imputation procedures. Missing values were imputed using the multiple imputation software Amelia-2 (for R version 3.2.1+) in 10 datasets. These 10 imputed datasets were combined using Rubin's rules for combining estimates obtained from multiple imputed datasets (30). Because estimated trajectories of change and effect sizes were highly similar for the imputed and non-imputed data, results based on the non-imputed data set are reported. Results of the imputed data are available upon request from the first author.

Results

Between March 2009 and June 2014, 243 patients were referred to MBT in the participating treatment centres, of whom 114 met inclusion criteria and were randomized (see Figure 1). Table 2 shows demographic and clinical characteristics at baseline. There were no significant baseline differences between patients who were excluded and patients who were randomized. Treatment groups did not show any significant differences at baseline, except for self-harm. A greater number of patients assigned to MBT-IOP reported self-harm in the previous 6 months ($\chi^2(1)=3.96$, p<0.001), although

there was no significant difference in reported frequency. Average treatment duration was slightly, although significantly, shorter in MBT-DH (M=14.3 months, SD=4.2) compared with MBT-IOP (M=15.9 months, SD=3.1), t(109)=2.223, p=0.028. The overall dropout rate was 12% (n=14), with no differences between the groups (n=5, 11% for MBT-IOP and n=9, 13% for MBT-DH), χ^2(1)=0.056, p=0.813.

[Insert Figure 1]
[Insert Table 2]

Primary outcome

Improvement over time between baseline and 18 months after start of treatment was significant, representing large effect sizes, in both MBT-IOP (d=0.83) and MBT-DH (d=1.16). There was no evidence for a differential rate of change between the two groups (β=−0.06, 95% CI=−0.19 to 0.07, z=−0.88, p=0.377). The between-group effect size of Cohen's d=0.34 indicated that MBT-DH was not superior to MBT-IOP in terms of improvements in symptom severity based on the a priori specified Cohen's d≥0.5 margin (see Table 3).

[Insert Table 3]

Secondary outcomes

Significant improvements were observed on all secondary outcome measures 18 months after start of treatment, representing moderate to very large within-group effect sizes for both MBT-DH and MBT-IOP (see Table 3). For most secondary outcome measures, the differential rate of change between MBT-DH and MBT-IOP was not significant, with two exceptions, both in the domain of relational functioning. The differential rate of change was significantly larger for MBT-DH relational capacities as measured with the SIPP (β=0.12, 95% CI=0.02 to 0.22, z=2.26, p=0.024), and there was a similar trend for interpersonal problems as measured by the IIP (β=−7.40, 95% CI=−14.93 to 0.13, z=−1.93, p=0.056).

On secondary outcomes, between-group effect sizes consistently favoured MBT-DH, with multiple secondary outcome measures indicating MBT-DH to be superior to MBT-IOP at 18 months, defined as between-group differences ≥0.5. This was also the case on the PAI-BOR, which assesses

core features of borderline pathology. However, both treatment groups showed similar improvements in terms of suicide attempts and self-harm, with medium to large effect sizes.

Discussion

This is the first study to compare the efficacy of two intensities of MBT for patients with BPD. Both treatment groups showed major improvements on primary and secondary outcome measures 18 months after start of treatment. Within-group effect sizes were for the most part large to very large and comparable to those found in other studies of MBT (6, 9-11, 13, 14). Treatment dropout was relatively low (M=12%, n=14) compared with that reported in other RCTs of specialized BPD treatments (31). Contrary to our hypothesis, MBT-DH was not superior to MBT-IOP in terms of reductions in symptom severity. However, MBT-DH showed a tendency towards superiority on most secondary outcomes, with medium to large between-group effect sizes (range d=0.51 to 1.82). Importantly, although patients in both MBT-DH and MBT-IOP showed large improvements in core features of BPD, there was a clear trend for MBT-DH to be associated with greater changes in BPD features. Yet, between-group differences were most pronounced in the domain of relational functioning, with patients in MBT-DH showing large improvements, whereas patients in MBT-IOP showed limited improvements over the course of 18 months. This latter finding may perhaps be in part explained the greater availability of the "safety net" provided by the day hospital setting of MBT-DH. Patients in MBT-DH might have had more opportunities to experiment with new (interpersonal) behaviours within a relatively safe context, whereas patients in MBT-IOP were forced to experiment with new interpersonal behaviours mainly in their own personal environment, which may not yet provide the safe context that would assist successful generalization of therapeutic gains. These views are consistent with recent conceptualizations of therapeutic change in BPD patients (32), emphasizing the need for BPD patients to generalize what they have learned in treatment to the real world outside the treatment context. However, patients in MBT-DH may begin to struggle with the same interpersonal problems as patients in MBT-IOP after the end of their treatment, when their "safety net" has largely disappeared. Thus, longer-term follow-up is imperative to provide more accurate estimates of sustained change in both types of treatment. In addition, further exploration of the mechanisms of change in both treatment conditions would serve to shed more light on these assumptions. Future reports will focus on these issues.

Irrespective of the fact that there was no clear evidence for the superiority of MBT-DH 18 months after the start of treatment and irrespective of whether or not there is evidence for the superiority of MBT-DH at longer-term follow-up, the current findings suggest that patients in MBT-DH and MBT-IOP follow different trajectories of change, which may be important not only for patients but also for clinical decision-making.

There are a number of important limitations of this study that should be kept in mind when interpreting the results. First, the choice of symptom severity as our primary outcome measure was based upon the need to facilitate future comparison with treatment outcome in clinical practice by using a simple and widely used outcome measure. However, the BSI might not capture key BPD features. Therefore, we also included more specific BPD measures as secondary outcomes, including the PAI-BOR, the IIP and SIPP. Note, however, that the BSI was highly significantly correlated with the PAI-BOR in the current study ($r=.73$, $p<.01$). Second, although both MBT programmes were offered by certified therapists, treatment sites were monitored for adherence to MBT quality guidelines, and within-session adherence in individual therapy was monitored, important features of adherence to MBT (i.e., continuous adherence to the model at the level of programme organization and in group therapy) were not systematically measured in this study. The potential influence of these factors was somewhat mitigated, however, by the finding that there were no differences in within-session adherence between MBT-DH and MBT-IOP and both treatments were offered by the same treatment services. Third, there was a considerable percentage of missing data in the study, particularly at follow-up assessments. However, the multiple imputation analyses yielded comparable results. Fourth, the superiority margin set in this study corresponded to a medium effect size. Smaller between-group differences may be clinically relevant, and thus further research is needed to address this issue. Fifth, the tendency of MBT-DH to be superior on secondary outcomes might reflect chance findings, particularly as there were no differences in terms of self-destructive behaviour. Findings of this study therefore need to be replicated, and longer-term follow-up is needed to investigate whether these differences are maintained in the longer term. Sixth, it cannot be ruled out that pharmacotherapy might have contributed to the observed improvements, as medication use over the course of treatment was not included in the analyses. However, there were no differences between the conditions in terms of the percentage of patients using medication at baseline and during treatment. Finally, randomization to the two conditions was skewed. However, there were no baseline

differences between the two groups, with the exception of slightly higher levels of self-reported self-harm in MBT-IOP.

In conclusion, this study suggests that treatment intensity may have an effect on treatment outcomes in a specialized psychological treatment for BPD patients, at least 18 months after the start of treatment and in particular domains of functioning. This finding is important given the increasing financial pressure to develop less intensive treatments and the gradual discontinuation of high-intensity programmes in clinical practice. The current findings suggest that such a policy may be premature, as there was a tendency for MBT-DH—the more intensive treatment—to be more effective than MBT-IOP on a range of secondary outcomes. Ultimately, longer-term follow-up and considerations concerning the cost-effectiveness of both treatments may be key in determining the optimal intensity of specialized treatments for BPD patients, such as MBT. This will be addressed in future reports.

Statement of ethics

This study was approved by the Medical Ethical Committee of Erasmus Medical Center, Rotterdam, the Netherlands (NL38571.078.12).

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Author contributions

PL, RV, JJMD, DLB and DJF designed the study and directed the trial. DLB and PL were responsible for MBT quality aspects within the trial. DJF, MLS, EMPL coordinated the trial and data collection. MLS, EMPL, MBJS, ZL, JJMD were responsible for trial implementation and data collection on the treatment sites. MLS, HVE, MB and PL performed the data analysis. MLS, DJF, RV and PL interpreted the data and drafted the article. HVE, DLB, EMPL, MB, MS, JJMD and ZL revised the manuscript. All authors; MLS, DJF, HVE, DLB, EMPL, MB, MBJS, JJMD, ZL, RV and PL, approved of the final version to be submitted for publication.

References

1.   Laurenssen EMP, Smits ML, Bales DL, Feenstra DJ, Eeren HV, Noom MJ, et al. Day hospital Mentalization-based treatment versus intensive outpatient Mentalization-based treatment for patients with severe borderline personality disorder: protocol of a multicentre randomized clinical trial. *BMC Psychiatry* 2014; **14**: 12.

2.   American Psychiatric Association. *Practice guidelines. Treatment of patients with borderline personality disorder*. American Psychiatric Association, 2001.

3.   Dutch Committee of Guideline-Development for Mental Health Care. *Multidisiplinaire richtlijn persoonlijkheidsstoornissen versie 1*. Trimbos Instituut, 2008.

4.   National Institute for Health and Clinical Excellence (NICE). *Borderline personality disorder: Treatment and management*. Author, 2009.

5.   Bateman A, Fonagy P. *Mentalization-based treatment for personality disorders: a practical guide*. Oxford University Press, 2016.

6.   Bateman A, Fonagy P. Effectiveness of partial hospitalization in the treatment of borderline personality disorder: a randomized controlled trial. *Am J Psychiatry* 1999; **156**(10): 1563-9.

7.   Bateman A, Fonagy P. 8-year follow-up of patients treated for borderline personality disorder: mentalization-based treatment versus treatment as usual. *Am J Psychiatry* 2008; **165**(5): 631-8.

8.   Bateman A, Fonagy P. Treatment of borderline personality disorder with psychoanalytically oriented partial hospitalization: an 18-month follow-up. *Am J Psychiatry* 2001; **158**(1): 36-42.

9.   Bales D, Timman R, Andrea H, Busschbach JJ, Verheul R, Kamphuis JH. Effectiveness of day hospital mentalization-based treatment for patients with severe borderline personality disorder: a matched control study. *Clin Psychol Psychother* 2014.

10.   Bales D, van Beek N, Smits M, Willemsen S, Busschbach JJV, Verheul R, et al. Treatment outcome of 18-month day hospital mentalization-based treatment in patients with severe borderline personality disorder in the Netherlands. *J Pers Disord* 2012; **26**: 568-82.

11.   Bateman A, Fonagy P. Randomized controlled trial of outpatient mentalization-based treatment versus structured clinical management for borderline personality disorder. *Am J Psychiatry* 2009; **166**(12): 1355-64.

12.   Jørgensen CR, Bøye R, Andersen D, Døssing Blaabjerg AH, Freund D, Jordet H, et al. Eighteen months post-treatment naturalistic follow-up study of mentalization-based therapy and supportive group treatment of borderline personality disorder: Clinical outcomes and functioning. *Nord Psychol* 2014; **66**(4): 254-73.

13.   Jørgensen CR, Bøye R, Boye R, Jordet H, Andersen D, Kjolbye M. Outcome of mentalization-based and supportive psychotherapy in patients with borderline personality disorder: a randomized trial. *Acta Psychiatr Scand* 2013; **127**(4): 305-17.

14.   Kvarstein EH, Pedersen G, Urnes O, Hummelen B, Wilberg T, Karterud S. Changing from a traditional psychodynamic treatment programme to mentalization-based treatment for patients with borderline personality disorder--does it make a difference? *Psychol Psychother* 2015; **88**(1): 71-86.

15.   De Beurs E. *Brief Symptom Inventory 18, -BSI 18-, Handleiding herziene editie*. PITS B.V., 2011.

16.   Derogatis LR. *Brief Symptom Inventory*. MD: Clinical Psychometric Research, 1975.

17.   First MB, Spitzer RL, Gibbon M, Williams JBW. *Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I)*. American Psychiatric Press, 1997.

18.   First MB, Spitzer RL, Gibbon M, Williams JBW, Benjamin L. *Structured clinical interview for DSM-IV axis II personality disorders (SCID II)*. American Psychiatric Press, 1996.

19.   Bateman A, Fonagy P. *Psychotherapy for borderline personality disorder: mentalization-based treatment*. Oxford University Press, 2004.

20.   Bateman A, Fonagy P. *Handbook of mentalizing in mental health practice.* American Psychiatric Publishing, 2012.

21.   Bateman A, Bales D, Hutsebaut J. *A quality manual for MBT*. 2014. Retrieved from http://www.annafreud.org/media/1217/a-quality-manual-for-mbt-edited-april-23rd-2014-2.pdf.

22.   Bateman A, Fonagy P. MBT Adherence Scale. *Available on request from the Anna Freud National Centre for Children and Families* 2018.

23.   Distel MA, De Moor MHM, Boomsma DI. Nederlandse vertaling van de Personality Assessment Inventory-borderline schaal (PAI-BOR): Normgegevens, factorstructuur en betrouwbaarheid. *Psychologie en Gezondheid* 2009; **37**: 38-46.

24.   Verheul R. *SIPP-SF: Severity Indices for Personality Problems Short Form*. 2006. Retrieved from https://www.deviersprong.nl/.

25.   Verheul R, Andrea H, Berghout CC, Dolan C, Busschbach JJV, van der Kroft PJA, et al. Severity indices of personality problems (SIPP-118): Development, factor structure, reliability, and validity. *Psychol Assess* 2008; **20**(1): 23-34.

26.   Horowitz LM, Alden LE, Wiggins JS, Pincus AL. *Inventory of Interpersonal Problems: Manual.* The Psychological Corporation, 2000.

27.   Zevalkink J, de Geus J, Hoek W, Berghout CC, Brouwer D, Riksen-Walraven JMA, et al. *Handleiding IIP-64-NL: Inventory of Interpersonal Problems - Nederlandse versie (Manusscript in preparation, version 4.2. june 2012).* Intern rapport Nederland Psychoanalytisch Instituut, 2012.

28.   Brooks R, Rabin R, de Charro F. *The measurement and valuation of health status using EQ-5D: A European perspective.* Kluwer Academic Publishers, 2003.

29.   Cohen J. *Statistical power analysis for the behavioral sciences.* Lawrence Erlbaum Associates, 1988.

30.   Rubin DB. *Multiple imputation for survey nonresponse.* Wiley, 1987.

31.   Barnicot K, Katsakou C, Marougka S, Priebe S. Treatment completion in psychotherapy for borderline personality disorder: a systematic review and meta-analysis. *Acta Psychiatr Scand* 2011; **123**: 327-38.

32.   Fonagy P, Luyten P, Allison E. Epistemic pertrification and the restoration of epistemic trust: A new conceptualization of borderline personality disorder and its psychosocial treatment. *J Pers Disord* 2015; **29**(5): 575-609.

Table 1. Comparison of Intensive Outpatient Mentalization-Based Treatment (MBT-IOP) and Day Hospital Mentalization-Based Treatment (MBT-DH)

Pretreatment
Patients from MBT-DH and MBT-IOP entered an identical pretreatment program during the waiting period, focusing on engaging patients in treatment and crisis management by means of low-frequency individual sessions, including a 12-session psychoeducation group.

Main treatment phase – maximum of 18 months

MBT-DH and MBT-IOP share five treatment goals: (1) engagement in therapy; (2) reduction of psychiatric symptoms; (3) reduction of self-destructive behavior; (4) improved social and interpersonal functioning; and (5) improvement of general functioning. The main treatment phase of MBT-DH and MBT-IOP is the same in length, with a maximum of 18 months, and shares the following individual components:

- Weekly individual psychotherapy
- Individual crisis management (on average weekly for 3 months, gradually lowering in frequency)
- Psychiatric consultation upon request following American Psychiatric Association guidelines

MBT-DH and MBT-IOP differ markedly in terms of frequency of group psychotherapy:

MBT-IOP	MBT-DH
• 2 times a week group therapy	• 5 times a week group psychotherapy • 4 times a week group art therapy/writing therapy/ mentalizing cognitive therapy • Social hour and community meeting

Post-treatment – maximum of 18 months

For patients in both treatment programs, the final phase offers individually tailored stepped-down care, aimed at relapse prevention, maintaining and further enhancing the gains made in mentalizing capacity, and stimulating further change and social reintegration.

Table 2. Baseline demographic and clinical characteristics of patients with borderline personality disorder in Intensive Outpatient Mentalization-Based Treatment (MBT-IOP) or Day Hospital Mentalization-Based Treatment (MBT-DH)

	MBT-IOP (N=44)		MBT-DH (N=70)	
	Mean	SD	Mean	SD
Age	29.9	9.2	31.4	10.6
Number of Axis I disorders	2.6	2.3	2.6	2.1
Number of comorbid Axis II PDs	1.5	0.6	1.3	0.5
GSI	1.94	0.57	1.89	0.55
SIPP Self-Control	2.04	0.44	2.16	0.40
SIPP Identity	1.90	0.46	1.90	0.40
SIPP Responsibility	2.46	0.48	2.66	0.38
SIPP Relational Capacities	2.28	0.57	2.16	0.46
SIPP Social Concordance	2.66	0.43	2.77	0.43
IIP total	108.63	17.19	109.48	15.22
PAI-BOR total	49.52	5.80	46.94	6.25
EQ-5D	0.45	0.13	0.47	0.13
	N	%	N	%
Female	35	80	59	84
Educational level				
Low	1	3	5	8
Medium	21	53	41	61
High	18	45	21	31
No vocational/volunteer activity	28	74	56	88
Criminal record	38	93	53	82
At least 1 symptom disorder	35	80	57	81
Mood disorder	25	57	40	57
Substance use disorder	15	34	26	37
Anxiety disorder	17	39	35	50
Eating disorder	11	25	11	16
At least 1 comorbid PD	17	39	23	33
Self-harm in past 6 months	25	62.5	23	41.8
Suicide attempt in past 6 months	6	15.4	13	23.2

Note. Baseline estimates based on predicted values

Table 3. Predicted means and results from multilevel models on primary and secondary outcome measures for patients randomly assigned to Intensive Outpatient Mentalization-Based Treatment (MBT-IOP) (N=44) or Day Hospital Mentalization-Based Treatment (MBT-DH) (N=70)

	Symptom Severity (GSI)				Identity Integration (SIPP)				Self-Control (SIPP)			
	MBT-IOP		MBT-DH		MBT-IOP		MBT-DH		MBT-IOP		MBT-DH	
	M	95% CI	M	95% CI	M	95% CI	M	95% CI	M	95% CI	M	95% CI
Baseline	1.94	1.81 to 2.08	1.89	1.79 to 1.99	1.90	1.79 to 2.00	1.90	1.83 to 1.98	2.04	1.94 to 2.15	2.16	2.08 to 2.23
18 months	1.41	1.20 to 1.62	1.18	1.02 to 1.34	2.43	2.19 to 2.67	2.81	2.63 to 2.99	2.56	2.37 to 2.75	2.90	2.75 to 3.04
Model: Wald X²	43.77 (df=3)				57.50 (df=3)				59.69 (df=4)			
Linear Change	−0.18**	−0.28 to -0.08		p=0.001	0.18**	0.07 to 0.29		p=0.001	0.05	−0.12 to 0.21		p=0.561
Quadratic Change	-	-		-	-	-		-	0.04*	−0.01 to 0.08		p=0.045
Δ Linear Change	−0.06	−0.19 to 0.07		p=0.377	0.12	−0.01 to 0.26		p=0.079	0.07	−0.05 to 0.20		p=0.245
Δ Group 18 months	−0.23	−0.60 to 0.14		p=0.228	0.38	−0.03 to 0.78		p=0.068	0.34	−0.00 to 0.68		p=0.051
Within-group ES	0.83		1.16		0.84		1.56		0.97		1.47	
Between-group ES	0.34				0.50				0.57			

	Social Concordance (SIPP)				Responsibility (SIPP)				Relational Capacities (SIPP)			
	MBT-IOP		MBT-DH		MBT-IOP		MBT-DH		MBT-IOP		MBT-D	
	M	95% CI	M	95% CI	M	95% CI	M	95% CI	M	95% CI	M	95% CI
Baseline	2.66	2.56 to 2.77	2.77	2.69 to 2.85	2.46	2.34 to 2.57	2.66	2.59 to 2.73	2.28	2.14 to 2.41	2.16	2.08 to 2.25
18 months	2.84	2.69 to 2.99	3.09	2.98 to 3.20	2.80	2.62 to 2.99	2.89	2.76 to 3.01	2.41	2.20 to 2.62	2.65	2.52 to 2.77
Model: Wald X²	22.94 (df=4)				25.35 (df=3)				25.23 (df=3)			
Linear Change	0.18**	0.05 to 0.32		p=0.007	0.12***	0.05 to 0.18		p<0.000	0.04	−0.03 to 0.12		p=0.276
Quadratic Change	−0.04*	−0.08 to −0.01		p=0.025	-	-		-	-	-		-
Δ Linear Change	0.05	−0.04 to 0.13		p=0.271	−0.04	−0.12 to 0.04		p=0.322	0.12*	0.02 to 0.22		p=0.024
Δ Group 18 months	0.25	−0.01 to 0.51		p=0.058	0.08	−0.20 to 0.36		p=0.566	0.24	−0.07 to 0.55		p=0.133
Within-group ES	0.39		0.75		0.63		0.51		0.21		0.98	
Between-group ES	0.54				0.15				0.39			

	Borderline symptomatology (PAI-BOR)		Quality of life (EQ)		Interpersonal problems (IIP)	
	MBT-IOP	MBT-DH	MBT-IOP	MBT-DH	MBT-IOP	MBT-DH

	M	95% CI	M	95% CI	M	95% CI	M	95% CI	M	95% CI	M	95% CI
Baseline	49.52	48.11 to 50.92	46.94	45.74 to 48.13	0.45	0.42 to 0.48	0.47	0.45 to 0.50	108.63	104.69 to 112.57	109.48	106.59 to 112.37
18 months	38.98	36.22 to 41.73	33.91	31.78 to 36.04	0.62	0.58 to 0.66	0.71	0.68 to 0.74	106.83	97.57 to 116.09	85.48	78.44 to 92.53
Model: Wald X²	73.80 (df=3)				35.05 (df=3)				11.43 (df=3)			
Linear Change	−3.52***	−5.03 to −2.00		p<0.001	0.06**	0.02 to 0.09		p=0.004	−0.60	−6.42 to 5.22		p=0.840
Quadratic Change	-	-		-	-	-		-	-	-		-
Δ Linear Change	−0.83	−2.77 to 1.11		p=0.402	0.02	−0.03 to 0.07		p=0.381	−7.40	−14.93 to 0.13		p=0.056
Δ Group 18 months	−5.07	−10.54 to 0.41		p=0.070	0.09	−0.03 to 0.21		p=0.155	−21.35*	−41.91 to −0.79		p=0.042
Within-group ES	1.41		1.69		1.26		1.82		0.07		1.02	
Between-group ES	0.57				0.67				0.70			

	Frequency of self-harm (SSHI)				Frequency of suicide attempts (SSH)			
	MBT-IOP		MBT-DH		MBT-IOP		MBT-DH	
	Log M	95% CI	Log M	95% CI	Log M	95% CI	Log M	95% CI
Baseline	1.60	1.34 to 1.86	0.88	0.68 to 1.08	0.19	0.12 to 0.26	0.17	0.13 to 0.21
18 months	0.40	0.20 to 0.60	0.39	0.24 to 0.54	0.04	0.00 to 0.07	0.05	0.03 to 0.07
Model: Wald X²	43.79 (df=5)				8.27 (df=3)			
Linear change	0.14	−0.35 to 0.63		p=0.588	−0.05*	−0.10 to −0.00		p=0.037
Quadratic Change	−0.18*	−0.32 to -0.04		p=0.014	-	-		-
Δ Linear Change	−0.37	−1.00 to 0.25		p=0.238	0.01	−0.05 to 0.07		p=0.716
Δ Quadratic Change	0.20*	0.02 to 0.39		p=0.030	-	-		-
Δ Group 18 months	−0.01	−0.53 to 0.51		p=0.973	0.01	−0.11 to 0.14		p=0.828
Within-group ES	1.34		0.59		0.70		0.75	
Between-group ES	0.02				0.14			

Note. MBT-IOP = Intensive outpatient Mentalization-Based Treatment. MBT-DH = Day Hospital Mentalization-Based Treatment. GSI = Global Severity Index of the Brief Symptom Inventory. SIPP = Severity Indices of Personality Problems. PAI-BOR = Personality Assessment Inventory – Borderline Personality Disorder section. EQ = EuroQol 5D. IIP = Inventory of Interpersonal Problems. SSHI = Suicide and Selfharm Inventory. Δ linear/quadratic change = differential change of MBT-DH compared to MBT-IOP over time. Δ group 18 months = difference of MBT-DH compared to MBT-IOP at 18 months. ES = Effect size by means of Cohen's *d*. M = Mean. 95% CI = 95% confidence interval. *p < .05 **p < .01 ***p < .001.

Figure 1. CONSORT Flow Diagram