Mentalization-Based Treatment in Adolescent Inpatients: A Naturalistic Multi-Informant Study of Outcomes

Noor Tromp PhD[1], Parlan Jeugdhulp, Alkmaar, The Netherlands

Rob van Dijk MD, GGZ Breburg, Tilburg, The Netherlands

Rob Saunders PhD, University College London, United Kingdom

Peter Fonagy PhD, University College London, and Anna Freud National Centre for Children and Families, London, United Kingdom

KEYWORDS: MBT-A, adolescents, personality pathology, quality of life, multi-informant

[1] Corresponding author: noor.tromp@parlan.nl

Abstract

The present era of major cutbacks in intensive treatment programs throughout Europe stresses the importance of evaluating the outcomes of such programs for adolescents with severe personality pathology and comorbidity. Personality pathology has proven to be a valid concept in adolescents, with relatively high prevalence, that needs to be targeted by evidence-based interventions. The present study focused on the evaluation of outcomes of a 12-month MBT-A program in 118 inpatient adolescents with personality pathology symptoms, using a multi-informant multi-domain design. The results showed that during treatment, adolescents improved on general psychiatric symptoms, personality pathology dimensions, health-related and generic quality of life. Improvement was not only statistically significant, but also clinically important, especially for internalizing domains. Implications for clinical practice and research are discussed.

Introduction

The occurrence and validity of personality pathology in youth is increasingly supported by empirical evidence (Newton-Howes, Clark, & Chanen, 2015). Studies have shown that the prevalence is relatively high. According to studies in representative community or primary care settings, the median prevalence estimate of adolescent personality disorder (PD) is 11% (Johnson, Bromley, Bornstein, & Sneed, 2006). In clinical samples, around 40% of adolescents were diagnosed with at least one PD (Feenstra, Busschbach, Verheul, & Hutsebaut, 2011; Tromp & Koot, 2008). Moreover, adolescent personality pathology is associated with behavioral, emotional and psychosocial problems, such as educational difficulties, stressful life events, and substance use (Johnson, Smailes, Cohen, Brown, & Bernstein, 2000; Levy et al., 1999; Lofgren, Bemporad, King, Lindem, & O'Driscoll, 1991; Westen, Shedler, Durrett, Glass, & Martens, 2003). Personality pathology has been linked to a greater risk of suicide and self-harm at young age (Brent et al., 1994; Levy, 2005). Among adolescents with borderline PD, self-harm and suicidal behavior is the most frequently reported DSM-criterion (Kaess, Brunner, & Chanen, 2014). Furthermore, treatment-seeking adolescents with personality pathology in

2

The Netherlands reported low quality of life and high usage of health care, with average costs of €14.032 per patient in the year prior to treatment, mainly due to inpatient health care (57.1%) and outpatient mental health care (15.4%; Feenstra et al., 2012). Appropriate evidence-based interventions are needed that target these enduring and pervasive problems (Sharp & Fonagy, 2015).

Several guidelines identify psychotherapy as the intervention of first choice for patients with personality pathology (NICE, 2009; Trimbos, 2008). In addition, guidelines advise psychotherapeutic interventions with high frequency and relative long duration, to be implemented according to a stepped-care model. However, in several European countries intensive treatment programs have suffered from of major cutbacks. In The Netherlands, for example, the capacity for inpatient mental health care with a maximum duration of 1 year was reduced by over 22% from 2012 to 2016 (Hoof et al., 2017), and all facilities for inpatient clinical group psychotherapy for adolescents are closed since 2019.

Psychotherapeutic interventions. In the past decade several psychotherapeutic interventions have been developed or adapted for adolescents with personality pathology. None of these interventions are evidence-based for adolescents. However, promising results have been found in adolescent samples for, for example, Dialectical Behavior Therapy for Adolescents (DBT-A; Rathus & Miller, 2002), Emotion Regulation Therapy (ERT; Schuppert et al., 2009), Helping Young People Early (HYPE; Chanen et al., 2009), and Mentalization-Based Treatment for Adolescents (MBT-A; Rossouw & Fonagy, 2012). ERT and HYPE have been developed as early interventions for mild to moderate pathology, whereas DBT-A and MBT-A have been developed especially for patients with severe personality pathology. The present paper offers a naturalistic evaluation of the outcomes of MBT-A in inpatient adolescents with severe personality pathology and comorbidity.

Mentalization-Based Therapies. MBT-A is adapted from its adult counterpart MBT, which is an evidence-based treatment developed by Bateman and Fonagy (2016). While often categorized as psychodynamic, MBTs are seen as integrative: bringing together aspects of psychodynamic, cognitive-behavioral, systemic, and ecological approaches. MBT-A, similar to other applications of the therapy, defines mentalizing as a form of imaginative mental activity whereby human behavior is implicitly and automatically perceived in terms of putative mental states (e.g. needs, desires, feelings, beliefs,

goals, purposes, and reasons) that may account for actions and are sometimes consciously and explicitly reflected on in mental-state terms (Fonagy, Gergely, Jurist, & Target, 2002). MBT-A aims to strengthen the individual's capacity for effective mentalizing. Mentalizing is ineffective and likely to be inaccurate when it is dominated by automatic, excessively self-focused, emotion-driven ideas or when it is excessively focused on others, overly cognitive, and reflective in a ruminative manner (Fonagy & Luyten, 2009). It is suggested that the mentalizing capacities of adolescents with PD features are compromised, and may account for the problems in interpersonal relationships and self-regulation which they experience. Research shows that particularly hypermentalizing, i.e. overinterpreting social signs, is strongly associated with borderline features in adolescents, such as affective instability, identity problems, negative relationships, and self-harm (Sharp et al., 2011; Sharp et al., 2016).

While applying MBTs, treatment effects are achieved by the therapist maintaining a 'mentalizing stance'. Through the use of this stance, the therapist demonstrates his/her own interest in (and curiosity about) the mental states underpinning behavior, qualifying his/her own understanding and inferences (showing respect for the opaqueness of mental states) and showing how such information can help the patient to make sense of his/her subjective experience. The therapist consistently attempts to maintain good mentalizing using an active curious inquisitive stance in relation to the young person's communication directing joint attention towards mental states, adopting a not knowing stance which issues certainty, modelling an active effort to find out about opaque aspects of mental life, showing humility in particular acknowledging errors and expressing regret where relevant, showing a determination to explore misunderstanding and engaging in self-disclosure in the interest of transparency.

Research on MBT-A. The effectiveness of MBT-A has been examined in a randomized controlled trial (RCT) with 80 adolescents (mean age 14.7 years; 85% female) presenting to mental health care with self-harm and comorbid depression (Rossouw & Fonagy, 2012). Nearly 75% of the sample also qualified for a borderline PD diagnosis. The MBT-A program consisted of weekly individual MBT sessions and monthly MBT family sessions during one year. Results showed that MBT-A was more effective than treatment as usual in reducing self-harm and depression, as well as

borderline symptomatology. In a small pilot study in The Netherlands (Laurenssen et al., 2014), a group of 11 adolescents (mean age 16,5 years; 100% female) with borderline symptoms showed significant decreases in general psychopathology, improvements in personality functioning, and higher quality of life after an 11-month inpatient MBT-A program. Another Dutch cohort pilot study (Hauber, Boon, & Vermeiren, 2017) reported on the results of intensive partial hospitalization MBT-A in 62 adolescents treated for PD. They found significant reductions in psychological symptoms of distress, in PD traits and symptoms, as well as in the number of patients who qualified for one or more PDs. Finally, results in a Danish study in 34 adolescents with borderline features (Bo et al., 2016) provided support for MBT group treatment. Most adolescents improved on borderline personality traits, depression, peer- and parent-attachment, mentalizing, self-harm, and general psychopathology during the 1-year MBT group program.

These initial findings are promising. SharHowever, findings need to be replicated in larger samples as well as on a wider range of outcome domains reported by multiple informants. And while RCTs have high internal validity and are valuable to determine effectiveness of MBT-A compared to alternative treatments, their external validity is limited due to strict inclusion criteria which are seldom congruent with real patients. Also, in the context of economic pressures on intensive therapies for European youths, it is worthwhile to examine the outcomes of inpatient MBT-A for adolescents with (emerging) severe personality pathology. To the best of our knowledge, this is the first report investigating the treatment outcome of MBT-A at an inpatient unit in a large sample of adolescents. In doing so, we follow the TREND guidelines (Des Jarlais, Lyles, & Crepaz, 2004) for intervention evaluations involving nonrandomized designs. Outcome was monitored on both self- and parent-reported general psychiatric symptoms, dimensions of personality pathology, and generic quality of life, as well as on self-reported health-related quality of life. Given previous results on MBT-A effectiveness, it is hypothesized that especially indicators of internalizing (personality) problems (i.e., scales measuring (anxious and withdrawn) depressive symptoms, identity problems, and affective instability), self-harmful behaviour, general psychopathology, and quality of life show significant and clinically relevant improvement.

Method

Study population and procedure

The study population consists of young people aged 14 to 23 years, who were referred to a unit for clinical psychotherapy at Triversum Centre for Child and Adolescent Psychiatry in The Netherlands. The unit is specialized in the treatment of personality problems, mood and anxiety disorders, feelings of loneliness/isolation, interpersonal problems (at home and/or school), and self-destructive and self-injurious behaviour. Exclusion criteria for referral are schizophrenia, autism spectrum disorder, antisocial PD (due to the age criterion described in the DSM), IQ below 80, life-threatening suicidal behaviour and/or eating problems, and severe uncontrollable substance abuse and/or dependence. In the latter two cases, patients were advised to follow treatment in a clinic specialized in eating and substance use disorders, respectively, before referral to the unit for clinical psychotherapy.

All patients admitted between September 2010 and January 2016 were assessed using questionnaires administered shortly before admission (T0), around 6 months after admission (T1), and at discharge (T2) as part of the standard treatment and evaluation procedures. All patients and (if age < 18 years) their parents were asked to sign informed consent for permission to use the results for scientific research. Questionnaires were completed through internet-based assessments (ASEBA, KIDscreen) and paper-and-pencil format (DAPP-SF, EQ-5D), either at home (T0) or at the mental health centre (T1 and T2). The results presented in this paper are part of a larger longitudinal study which follows youths and their parents over a total period of 3 years.

During the research period, 143 patients were eligible for treatment at the unit (see Figure 1). Of those, 22 patients declined treatment for a variety of reasons. Of the remaining 121 patients, 3 adolescents and 2 parents refused to sign informed consent. The final study population therefore consisted of 118 patients (76% female; M age = 17.5 years, SD = 1.62, range 15-22 years) and 119 parents. Response rates ranged from 88% (DAPP-SF-P) to 100% (KIDscreen-27-A) at T0, from 68% (DAPP-SF-P) to 84% (KIDscreen-27-A) at T1, and from 51% (DAPP-SF-P) to 71% (YSR/ASR) at T2.

Figure 1 Flow chart of study population

Two weeks after admission patient, parents and clinicians signed a treatment contract in which Axis I disorders were listed based on a clinical diagnosis by the unit's psychiatrist using all available information, including for reports from the referring clinician. All patients had at least one Axis I disorder. On average, patients had 2.8 Axis I disorders ($SD = 1.16$, range 1 to 7). The highest prevalence rates were found for mood disorder (51%), anxiety disorder (19%), and developmental disorder (11%).

Treatment program

The study was conducted in a unit offering a specialized inpatient program for adolescents and young adults aged 14 to 23 years. At the time of the study, the unit could house 24 patients: 16 inpatient (divided into 2 groups) and 8 day hospital patients. The MBT-A treatment is protocolized and consists of a step-down program, with three phases of approximately six months each: inpatient care (weekdays and -nights), hospital daycare (weekdays), and outpatient care (once a week), respectively. The present study reports on treatment outcome after the first two phases (approximately 12 months).

Five days a week patients followed the MBT treatment program, applying an MBT-oriented psychodynamic group psychotherapy approach. All staff members applied a mentalizing focus. For example while discussing interpersonal relations: what happened in these interactions, what were the adolescent's mentalizing capacities, which attachment style was evoked? Furthermore, staff members adapt the mentalizing stance in being with the adolescents. For example, staff members are actively curious about the adolescents' thoughts and feelings, and model good mentalizing through self-disclosure of their own thoughts and feelings.

The treatment program consisted of sociotherapy (continuously), group psychotherapy (twice a week), psychodrama (once a week), psychomotor therapy (once a week), creative therapy (once a week), and family therapy (MBT-F; once a week). MBT-F focused on enhancing mentalizing between patients and their parents from a transactional and transgenerational perspective. MBT-oriented group therapies amounted to 22 hours a week. In addition, the program included weekly patient-staff meetings, weekend evaluations, community meetings, and progress evaluations. Every evening the day program officially ended in a social meeting. Four days a week, in the afternoons, patients

followed an individualized educational program at the school connected to the treatment unit. Friday afternoons all patients went home for the weekend. Parents were invited to join a parent group every 6 weeks, which was led by the unit's family therapist. Additional treatments were offered only if indicated. Individual psychotherapy was offered to approximately 5% of the study population, and EMDR to 5-10%. While approximately 80-90% of patients used psychopharmacological medication at admission, only 10-20% did so at discharge.

Clinicians work according to the one-team-treatment-principle, in which the multidisciplinary team collectively develops an individual treatment policy for each patient for the various disciplines using MBT formulation and linked interventions. The general treatment goal was to enhance mentalizing capacities in terms of self, other, and interpersonal relationships. In terms of the model of change process in MBT-A this was expected to achieve 1) greater commitment to treatment, 2) a reduction in psychiatric symptoms, 3) a reduction in impulsive behaviours such as self-mutilations and suicidality, 4) improvement in social and interpersonal functioning, and 5) increased capacity to undertake appropriate developmental tasks.

The entire treatment team has been continuously trained and supervised in MBT since 2008. From 2015 a certified training and supervision series was repeated in a 2-year program. Adherence to the MBT-model was further monitored by evaluating, after each group session, which interventions strengthened the patients' mentalizing capacity and which interventions weakened this capacity. For example, some patients experienced too much pressure in therapy when they were asked to explain their behavior or feelings in for them difficult situations. They felt insecure and their mentalizing capacity decreased. In difficult situations it was more helpful when the team focused on recovering sound mental functioning. So, rather than trying to find out and discuss what happened in a crisis situation, the team focused on reducing stress levels by, for example, taking a walk, drinking tea or doing relaxation exercises, together with the patient(s). In situations of decreased mentalizing capacity, rather than checking the patients' feelings, the not-knowing stance was more helpful, especially for patients with lower mentalizing capacities. In addition to the evaluations of each group session, every crisis intervention was critically evaluated in the team. And finally, during team learnings (every 2 months) the team members reflected on their own and other's mentalizing experiences. Numerical data

on adherence were not collected.

Outcome measures

Treatment commitment. Indicators of treatment commitment were dropout percentage and average length of treatment. Patients who quit treatment prematurely, against the advice of staff members who believe improvement is feasible, are defined as drop outs. In the present study, patients who drop out within the first month of treatment are called early drop outs, and those who drop out in a later stage of treatment are called late drop outs.

General psychiatric symptoms. General psychopathology was assessed using the Dutch versions of the ASEBA questionnaires (Achenbach, 2009) for both self- and parent-report. The Youth Self Report (YSR; Verhulst, Van der Ende, & Koot, 1997) is a self-report questionnaire for 11- to 18-year old youths that assesses competencies, and emotional and behavioral problems. The Adult Self Report (ASR; Achenbach & Rescorla, 2003) is the equivalent for respondents of 18 years and older. The Child Behavior Checklist (CBCL; Verhulst, Van der Ende, & Koot, 1996) is a parent-report questionnaire for parents of 6- to 18-year old youths. The Adult Behavior Checklist (ABCL; Achenbach & Rescorla, 2003) is the equivalent for parents of youths of 18 years and older. Due to the age distribution and the longitudinal design of the present study, ASR and ABCL were administered only to youths and their parents if youths were 18 years or older at admission, or if youths had turned 19 years old during treatment. All ASEBA questionnaires ask respondents to judge the past 6 months, and to indicate on a 3-point scale to what extent each item applies to them or their child: not at all (0), somewhat or sometimes true (1), or very true or often (2).

Raw scores were converted to age-standardized T-scores based on multicultural norms Group 2 (Achenbach & Rescorla, 2007) for YSR and CBCL, and based on American norms (Achenbach & Rescorla, 2003) for ASR and ABCL. For syndrome scales, T-scores below 65 fall within the normal range and T-scores above 68 fall within the clinical range. For total scales, T-scores below 60 fall within the normal range and T-scores above 63 fall within the clinical range. The present analyses include total scales as well as syndrome scales which appear in all four ASEBA questionnaires.

The psychometric qualities of the Dutch version ASEBA questionnaires have been extensively investigated and found adequate. In the present study, good internal consistencies were obtained at all time points. For the YSR, Cronbach's alphas for internalizing and externalizing problems were .92 and .88 at T0, .92 and .90 at T1, and .94 and .92 at T2. For the ASR, Cronbach's alphas for internalizing and externalizing problems were .87 and .89 at T0, .90 and .91 at T1, and .95 and .87 at T2. For the CBCL, Cronbach's alphas for internalizing and externalizing problems were .85 and .90 at T0, .89 and .85 at T1, and .90 and .88 at T2. Finally, for the ABCL, Cronbach's alphas for internalizing and externalizing problems were .83 and .92 at T0, .91 and .93 at T1, and .92 and .93 at T2.

Personality pathology. The Dimensional Assessment of Personality Pathology-Short Form for Adolescents (DAPP-SF-A; Tromp & Koot, 2015) is a self-report questionnaire comprising 144 items, scored on a Likert-type scale ranging from 1 (*very unlike me*) to 5 (*very like me*). The DAPP-SF-Parent is used to assess parent-reported personality pathology (of their child). The questionnaires include 18 lower-order dimensions of personality pathology. Higher scores indicate more personality pathology.

The psychometric qualities of the DAPP-SF-A are adequate (Tromp & Koot, 2015). In the present study, adequate to good internal consistencies were obtained for the lower-order dimensions. For the DAPP-SF-A, Cronbach's alphas ranged from .76 (Conduct Problems) to .91 (Self Harm) at T0, from .78 (Intimacy Problems) to .93 (Suspiciousness) at T1, and from .77 (Intimacy Problems) to .95 (Suspiciousness) at T2. For the DAPP-SF-P, Cronbach's alphas ranged from .77 (Conduct Problems) to .89 (Stimulus Seeking) at T0, from .75 (Anxiety) to .92 (Self Harm) at T1, and from .74 (Anxiety) to .92 (Self Harm) at T2.

Missing items were allowed with a maximum of five per questionnaire. Therefore, 1 DAPP-SF-A and 5 DAPP-SF-P's were removed from the dataset. For remaining questionnaires, missing items were imputed with estimated values using the expectation-maximization method. For 31 DAPP-SF-A's and 67 DAPP-SF-P's, one or more items were imputed.

Quality of Life. Quality of life was measured by both the EuroQol 5 Dimensions questionnaire (EQ-5D; EuroQol Group, 1990), and the KIDscreen-27 instruments for self- and parent-report (KIDscreen Group Europe, 2006). The EQ-5D is a self-report standardised measure of health-related

quality of life developed in order to provide a simple, generic measure of health for clinical and economic appraisal. It includes five dimensions (mobility, self-care, daily activities, pain/discomfort, and anxiety/depression) rated on three levels (no, some, or extreme problems). The scores on the five dimensions were converted to a single summary index using the Dutch time trade-off value set (Lamers, McDonnell, Stalmeier, Krabbe, & Busschbach, 2006), which is based on a sample representative of the Dutch general population. Higher scores indicate a better health-related quality of life. Measurement was available at T0 and T2 only.

The KIDscreen-27 measures generic quality of life on five dimensions: physical well-being, psychological well-being, autonomy & parent relation, social support & peers, and school environment. Items are rated on a 5-point Likert-scale ranging from never/not at all to always/extremely. The KIDscreen instruments have adequate reliability (Cronbach's alphas ranged from .80 to .84) and validity (KIDscreen Group Europe, 2006). Raw scores are transformed into T-values based on data from an international survey sample from twelve European countries. Higher values indicate higher quality of life.

Statistical analyses

Demographics were summarized using descriptive statistics. Treatment outcome is analysed according to intention-to-treat principles, using Generalized Estimating Equations (GEE) analyses in SPSS 25. GEE is a longitudinal regression technique which uses all available data, despite the fact that certain patients may not have completed all measurements (Twisk, 2013). To account for within-person dependency between measurements a within-subject correlation structure is added to the regression model. In the present analyses an exchangeable correlation structure was added, which assumes correlations between subsequent measurements to be the same, irrespective of the length of the time interval. A GEE analyses was performed for each outcome variable as dependent variable, with two dummy variables indicating time. The measurement at admission (T0) was used as reference category. Gender was added to the regression model as covariate. The regression coefficients of the two dummy variables represent an increase or decrease of a certain variable between admission and T1 or T2, respectively.

To determine the clinical importance of statistical significance, Jacobson, Follette, and Revenstorf's (1984) responder definition of clinically significant change was used. The percentages of patients meeting two criteria were calculated. Criterion A is met when an individual's score at discharge is $\geq$ 2 SD from the full sample mean score at admission (i.e., the sample the individual belonged to at admission). Criterion B is met when an individual's score at discharge is within 2 SD from the mean score on the measure in a non-clinical population. In order to provide baseline information on the studied population, and to allow for a comparison of percentages at discharge and admission, the percentages of patients meeting criterion A and B at admission were also calculated. Together, this information provides results at group level on change from admission to discharge compared to the sample itself (Criterion A) as well as to a non-clinical sample (Criterion B). To define criterion B, norms were used from different studies in non-clinical population samples for the DAPP-SF-A (Tromp & Koot, 2015), the ABCL and ASR (Achenbach & Rescorla, 2003), the CBCL and YSR (Achenbach & Rescorla, 2007), the EQ-5D (Stolk, Krabbe, & Busschbach, 2009), and the KIDscreen-27 (Lamers, McDonnell, Stalmeier, Krabbe, & Busschbach, 2006). For DAPP-SF-P, criterion B could not be computed because no data are available for the parent-version in a non-clinical population.

Results

Due to the large array of outcome measures, this section reports on baseline characteristics, treatment commitment, and on a selected set of critical parameters hypothesized to show significant and clinically relevant improvement based on previous research on MBT-A. These critical parameters are represented by the ASEBA-scales Anxious/Depressed, Withdrawn/Depressed, Internalizing Problems, and Total Problems; by the DAPP-SF-scales Identity Problems, Affective Instability, and Self Harm; by all KIDscreen-27-scales; and by the EQ-5D single summary index. The full array of results can be found in the online supplemental materials.

Baseline characteristics (self-report). In terms of general psychiatric symptoms, patients suffer mostly from Anxious/depressed and Withdrawn/depressed symptoms, with average scores at

admission in the clinical range, and 77% and 60% respectively scoring more than 2 SD above the mean in a non-clinical population. On Internalizing Problems and Total Problems, 75% and 65% of patients respectively score above the non-clinical mean. In terms of personality pathology, patients present with high scores especially on the dimensions Self Harm and Identity Problems, with 60% and 58% of patients respectively scoring more than 2 SD above the non-clinical mean. On Affective Instability, 35% of patients score above the non-clinical mean. In addition, patients suffer from Anxiety and Social Avoidance, with 58% and 54% of patients respectively scoring more than 2 SD above the non-clinical mean. In terms of health-related quality of life at admission, 60% of patients score more than 2 SD below the mean in a non-clinical population. Finally, in terms of generic quality of life, patients' average score was especially low on Psychological Well-Being. At admission, 44% of patients scored more than 2 SD below the non-clinical mean.

Treatment commitment. A total of 11 patients (9%) dropped out of treatment within the first month. Another 8 patients (7%) did so in a later stage of treatment. A little over 84% completed treatment. Dropouts did not differ significantly from completers in age, gender, internalizing and externalizing psychiatric symptoms, or personality pathology dimensions. The average length of treatment of those completing the treatment was 57 weeks (range 24 to 81 weeks).

Internalizing (personality) pathology. All critical parameters of internalizing (personality) pathology (i.e., Anxious/Depressed, Withdrawn/Depressed, Internalizing Problems, Identity Problems, and Affective Instability), as reported by both adolescents and parents, showed significant improvement at discharge (Tables 1 and 3). Effect sizes indicated moderate (e.g., 0.59 for self-reported Affective Instability) to large effects (e.g., 0.95 for parent-reported Identity Problems). Although adolescents did not report statistically significant improvement on the critical parameters at 6 months after admission, parents did at both T1 and T2.

In terms of clinical importance of significant change, at discharge only small percentages of patients met criterion A on the critical parameters of internalizing (personality) pathology, indicating that they had a discharge score which was 2 or more standard deviations below the sample mean score at admission (Tables 2 and 4). Percentages meeting criterion A at discharge, however, were substantially increased compared to percentages at admission. For example, 23.2% met criterion A on

self-reported Identity Problems at discharge compared to 1.8% at admission, and 26.4% met criterion A on parent-reported Internalizing Problems compared to 2.8% at admission. Criterion B was met by 39.3% (self-reported Anxious/Depressed) to 79.3% (self-reported Affective Instability) of patients at discharge, indicating that these patients had a discharge score within 2 standard deviations from the mean in a non-clinical population. At admission, percentages of patients meeting criterion B on the critical parameters of internalizing (personality) pathology ranged from 14.8% (parent-reported Internalizing Problems) to 65.2% (self-reported Affective Instability).

Self-harmful behaviour. Both adolescents and parents reported significant improvement on the dimension Self Harm at discharge, parents also did so at 6 months after admission (Table 3). Effect sizes indicated moderate effects (0.55 and 0.58, respectively).

In terms of clinical importance of significant change (Table 4), none of the patients met criterion A at discharge, indicating their discharge score was within 2 standard deviations from the mean score at admission. This may be partly caused by the relatively high standard deviation of this dimension (1.29). Criterion B was met by 68.3% of patients at discharge, indicating that almost 7 out of 10 patients had a discharge score within 2 standard deviations of the mean in a non-clinical population. Again, the large variation in the clinical sample may explain the finding at discharge that 0% meet criterion A whereas almost 70% meet criterion B. Of all 18 personality pathology dimensions, Self Harm showed the largest increase in the percentage of patients meeting criterion B between admission and discharge.

General psychopathology. Both adolescents and parents reported significant improvement on the Total Problems scale at discharge, parents also did so at 6 months after admission (Table 1). Effect size was moderate for self-report (0.72) and large for parent-report (1.24).

In terms of clinical importance of significant change (Table 2), 20.2% (self-report) and 27.8% (parent-report) of adolescents met criterion A, indicating they had a discharge score which was 2 or more standard deviations below the mean score at admission. This was a substantial increase compared to the percentages at admission (2.6 and 2.8, respectively). The percentages meeting criterion B (discharge score within 2 standard deviations from the mean in a non-clinical population) increased from 35.3 to 57.1% for self-report, and 21.3 to 59.7% for parent-report.

Quality of life. Adolescents and parents reported significant improvement on 4 out of 5 dimensions of the KIDscreen-27-A (Table 5). On most dimensions, improvement was reported both at 6 months after admission and at discharge. For those dimensions, effect sizes ranged from 0.43 (parent-reported School Environment) to 1.26 (parent-reported Psychological Well-Being), indicating small to large effects. No significant effects were found for the dimension Autonomy & Parent Relation. Adolescents also reported significant improvement on EQ-5D health-related quality of life, with an effect size of 0.70 indicating a moderate effect (Table 5).

In terms of clinical importance of significant change, at discharge only small percentages of patients met criterion A on self- and parent-reported dimensions of generic quality of life, indicating that only few patients had a discharge score which was 2 or more standard deviations below the mean score at admission (Table 6). Percentages did show, however, small increases between admission and discharge, except for self-reported Social Support & Peers and parent-reported Autonomy & Parent Relation. The largest increase was found for parent-reported Psychological Well-Being. Criterion B was met by the majority of patients on all dimensions of generic quality of life at discharge (ranging from 66.7% to 94.7%). On all dimensions, except for Autonomy & Parent Relation which showed a negligible decrease, the percentage meeting criterion B increased between admission and discharge. On health-related quality of life (Table 6), 9.9% of patients met criterion A at discharge, compared to 4.5% at admission. Criterion B was met by 77.8% of patients at discharge, compared to 40.5% at admission.

Discussion

The present era of major cutbacks in intensive treatment programs throughout Europe stresses the importance of evaluating the outcomes of such programs for adolescents with severe personality pathology and comorbidity. In the past few years, all inpatient facilities for these adolescents have been shut down in The Netherlands. To the best of our knowledge, the present report is the first to investigate the outcomes of an MBT-A inpatient unit in a large sample of adolescents. The measures on multiple domains and from multiple perspectives suggest that there is substantial improvement

between admission and discharge. Consistent with previous studies, the results showed that especially indicators of internalizing (personality) problems, such as depressive symptoms, identity problems, and affective instability, as well as indicators of quality of life improved during treatment. While the changes are large, they are not as large as one might hope after a one-year intensive program and the majority of patients remain symptomatic although at discharge many fall below the clinical threshold on a number of measures. The total percentage of (early and late) dropouts was low compared to previous studies in adolescents with personality pathology (Bo et al., 2016; Laurenssen et al., 2014; Rossouw & Fonagy, 2012).

Interestingly, whereas adolescents reported significant improvement mostly not sooner than discharge, parents reported significant improvement on many indicators both at 6 months into treatment and at discharge. This discrepancy was seen for both general psychiatric symptoms and personality pathology, but not for quality of life. An observational study of 45 diagnosed BPD adult patients admitted to day hospital MBT treatment in The Netherlands (Bales et al., 2012) also reports statistically significant self-reported treatment effects only after 12 months of treatment on almost all domains, such as symptom distress, quality of life and interpersonal problems. This suggests that treatment with long duration is necessary for both adolescent and adult patients with personality pathology to reach self-reported improvement. The reason that parents experience improvement in their child's problems sooner than adolescents remains to be studied. Previous research (Tromp & Koot, 2010) has suggested that although adolescents and parents show moderate cross-sectional agreement on levels of personality pathology, both informants uniquely contribute to variance in dysfunction. Together, these findings emphasize the need for a multi-informant approach in order to fully understand personality pathology, its associated dysfunction, and effectiveness of treatment in adolescents.

In addition to significance of observed change, the present study also reported on clinical importance of statistical significance. Despite statistical improvement on many domains, only few patients reached problem levels at discharge that are two or more standard deviations below levels at admission (criterion A). On some domains, such as Self Harm, not a single patient met criterion A at discharge. To some extent this may not be surprising, given the severity of pathology at admission in

the research population, as well as the fact that the present study does not report on the outpatient phase following the studied inpatient and day hospital phases. However, the results also showed that on all outcome measures except for ASEBA scales Anxious/Depressed and Internalizing Problems, the majority of patients reached problem levels at discharge within two standard deviations from mean levels in non-clinical populations. Future analyses of follow up data from the present longitudinal study (6, 12, and 24 months after discharge) will provide information on the long-term effects of MBT-A.

An unexpected finding is the lack of improvement on quality of life dimension Autonomy & Parent Relation. Interestingly, mean scores on this dimension are highest of all quality of life dimensions, suggesting little improvement is possible. Another possible explanation is that less autonomy and parental support is inherent to an intensive inpatient treatment. Another unexpected finding is the increase in self-reported dimensions Narcissism and Rejection during treatment, although effect sizes were small. Perhaps the intensive group treatment, and the accompanying continuous evaluations and feedback by both group and staff members, enforces adolescents with a rigid cognitive style (high Rejection) or ideas of grandiosity (high Narcissism) to hold on even stronger to their fixed ideas and to seek even more approval. These are, however, speculations which could be studied in the future using multilevel analyses.

A major strength of the present study is the use of a multi-informant multi-domain design. Using multiple informants results in a more comprehensive understanding of adolescent personality pathology and the effects of interventions, and may improve diagnostic procedures and intervention strategies. By reporting on the outcomes on multiple domains, this study adds relevant information to the literature on the effectiveness of MBT-A. A second strength is the external validity and clinical utility. The study was conducted in a naturalistic setting on a regular psychiatric unit, aiming to include all patients admitted to the unit regardless of personality pathology severity. Also, by reporting on clinical importance of statistical significance, results may be more meaningful to clinicians, adolescents, and their parents.

Although these findings are promising, this study has several limitations. First, by interpreting the results, the effects of attrition due to nonresponse and drop out should be considered, especially

since these were not statistically corrected for. Although response rates are high at the first

measurement (especially for self-report), they drop to 51% to 71% (for DAPP-SF-P and YSR/ASR,

respectively) at the final measurement. Adjusting for drop out results in more veracious response rates,

ranging from 74% to 83% for self-report and 60% to 71% for parent-report. Most of the patients who

dropped out of treatment did so within the first month. Clinical impression suggests that those patients

may have felt too agitated in a setting applying a psychodynamic group psychotherapy approach. After

all, many of the patients referred to the unit have lived in relative isolation before admission. A second

limitation is that the results were delivered by a single provider organization. Although the treatment

was protocolized, the generalizability of the results is therefore limited. On a related note, two authors

(NT, RvD) were employees of the provider organization, and one author (PF) developed the treatment

under study. Therefore, one could argue they are not fully independent evaluators. Third, general

psychiatric symptoms were measured using ASEBA questionnaires. Although these questionnaires are

widely used as evaluative instruments, there is an ongoing debate on their sensitivity to change due to,

for example, their use of a 3-point Likert scale. On the other hand, evidence suggests that the ASEBA

questionnaires do have the capacity to be used routinely to assess change over time (Deighton et al.,

2014). On a similar note, sensitivity to change has not yet been proven empirically for the DAPP-SF

measures. One could even argue that it is impossible for genetically predisposed traits, which are

operationalized by the DAPP questionnaire (Livesley, Jang, & Vernon, 1998), to change over time. In

clinical practice, however, the DAPP-SF has demonstrated to be useful in treatment evaluations,

giving patients and therapists detailed information on changes over time. Furthermore, interaction

effects between outcomes and fixed parameters such as age, gender and initial presentation were not

studied, because the sample was considered to be too small to divide into groups. It may be interesting

for future research to study differences in treatment outcomes for males and females, because gender

effects were reported for several outcome measures (e.g., Tromp & Koot, 2015). A final limitation is

the fact that the present study is a naturalistic study observing how outcome measures develop over the

course of treatment. A comparison of the efficacy of inpatient MBT-A compared to less intensive

programs is therefore not possible. Because use of medication or modifications in prescription were

not monitored, their value as an effective component of the treatment program cannot be assessed.

Research on the evidence of MBT-A could be brought to a higher level by meta analyzing the internationally available results of studies applying MBT-A at different levels of intensity and thus cost (e.g., inpatient, partial hospitalization, or outpatient), thereby controlling for the type and severity of (personality) pathology. Given the limited resources (financially as well as in terms of capacity) and the tendency away from relatively expensive inpatient treatment programs, such meta analytic findings provide essential information for a cost-effective and personalized treatment offer for adolescents with personality pathology. A possible future shift towards outpatient programs should be accompanied by increased attention, from researchers and clinicians alike, for the family system and broader informal network of the patient. What are their levels of supporting and mentalizing capacities and what are their needs for support when their child lives at home during his or her treatment? These factors can influence results on effectiveness. In other words, a shift towards outpatient treatment for adolescent with severe personality pathology asks for a systemic view in research and clinical practice.

Overall, the present study shows that adolescent inpatients with severe personality pathology and comorbidity as well as their parents report less internalizing (personality) pathology, and better quality of life after following MBT-A, with outcome levels approaching mean levels in non-clinical populations for the majority of adolescents.

Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

Achenbach, T.M. (2009). *The Achenbach System of Empirically Based Assessment (ASEBA): Development, findings, theory, and applications*. Burlington: University of Vermont.

Achenbach, T.M., & Rescorla, L.A. (2003). *Manual for the ASEBA adult forms and profiles*. Burlington: University of Vermont.

Achenbach, T.M., & Rescorla, L.A. (2007). *Multicultural supplement to the manual for the ASEBA school-age forms & profiles*. Burlington: University of Vermont.

Bales, D., Beek, N. van, Smits, M., Willemsen, S., Busschbach, J.J.V., Verheul, R., & Andrea, H. (2012). Treatment outcome of 18-month, day hospital mentalization-based treatment (MBT) in patients with severe borderline personality disorder in The Netherlands. *Journal of Personality*

Disorders, 26, 568-582.

Bateman, A.W., & Fonagy, P. (2016). *Mentalization-based treatment for personality disorders: A practical guide*. Oxford: Oxford University Press.

Bo, S., Sharp, C., Beck, E., Pedersen, J., Gondan, M., Simonsen, E. (2016). First empirical evaluation of outcomes for mentalization-based group therapy for adolescents with BPD. *Personality Disorders: Theory Research and Treatment, 8*, 396-401. doi: 10.1037/per0000210

Brent, D.A., Johnson, B.A., Perper, J., Connolly, J., Bridge, J., Bartle, S., et al. (1994). Personality disorder, personality traits, impulsive violence, and completed suicide in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 33*, 1080–1086.

Chanen, A.M., Jackson, H.J., McCutcheon, L.K., Jovev, M., Dudgeon, P., Yuen, H.P., & …McGorry, P.D. (2009) Early intervention for adolescents with borderline personality disorder: quasi-experimental comparison with treatment as usual. *The Australian and New Zealand Journal of Psychiatry, 43*, 397-408.

Deighton, J., Croudace, T., Fonagy, P., Brown, J., Patalay, P., & Wolpert, M. (2014) Measuring mental health and wellbeing outcomes for children and adolescents to inform practice and policy: a review of child self-report measures. *Child and Adolescent Psychiatry and Mental Health, 8*, 14. doi:10.1186/1753-2000-8-14

Des Jarlais, D.C., Lyles, C., & Crepaz, N. (2004). Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: the TREND statement. *American Journal of Public Health, 94*, 361–366.

EuroQol Group (1990). A new facility for the measurement of health-related quality of life. *Health Policy, 16*, 199-208.

Feenstra, D.J., Busschbach, J.J.V., Verheul, R., Hutsebaut, J. (2011) Prevalence and comorbidity of Axis I and Axis II disorders among treatment refractory adolescents admitted for specialized psychotherapy. *Journal of Personality Disorders, 25*, 842-850.

Feenstra, D.J., Hutsebaut, J., Laurenssen, E.M.P., Verheul, R., Busschbach, J.J.V., Soeteman, D.I. (2012). The burden of disease among adolescents with personality pathology: Quality of life and costs. *Journal of Personality Disorders, 26*, 593-604.

Fonagy, P., Gergely, G., Jurist, E. L., & Target, M. (2002). *Affect regulation, mentalization, and the development of the self.* New York: Other Press.

Fonagy, P., & Luyten, P. (2009). A developmental, mentalization-based approach to the understanding and treatment of borderline personality disorder. *Development and Psychopathology, 21,* 1355-81. doi: 10.1017/S0954579409990198.

Hauber, K., Boon, A.E., & Vermeiren, R. (2017). Examining changes in personality disorders and symptomatology in an adolescent sample receiving intensive mentalization based treatment: a pilot study. *Child and Adolescent Psychiatry and Mental Health, 11*, 58. doi: 10.1186/s13034-017-0197-9

Hoof, F. van, Knispel, A., Hulsbosch, L., De Lange, A., Michon, H., & Kroon, H. (2017) National monitor reforms prolonged mental health care [Landelijke monitor ambulantisering en hervorming langdurige GGZ]. Utrecht: Trimbos Institute.

Jacobson, N.S., Follette, W.C., & Revenstorf, D. (1984). Psychotherapy outcome research: Methods for reporting variability and evaluating clinical significance. *Behavior Therapy, 15*, 336-352. doi: 10.1016/S0005-7894(84)80002-7

Johnson, J.G., Bromley, E., Bornstein, R.F., Sneed, J.R. (2006). Adolescent personality disorders. In: DA Wolfe & EJ Mash (ed) *Behavioral and emotional disorders in children and adolescents: Nature, assessment, & treatment* (pp 463-484). New York: The Guilford Press.

Johnson, J.G., Smailes, E., Cohen, P., Brown, J., Bernstein, D.P. (2000). Associations between four types of childhood neglect and personality disorder symptoms during adolescence and early adulthood: Findings of a community-based longitudinal study. *Journal of Personality Disorders, 14*, 171-187.

Kaess, M., Brunner, R., & Chanen, A. (2014). Borderline personality disorder in adolescence. *Pediatrics, 134,* 782-793. doi:10.1542/peds.2013-3677

KIDscreen Group Europe (2006). *The KIDscreen questionnaires: Quality of life questionnaires for children and adolescents (Handbook)*. Lengerich: Pabst Science Publishers.

Lamers, L.M., McDonnell, J., Stalmeier, P.F., Krabbe, P.F., & Busschbach, J.J. (2006). The Dutch Tariff: Results and arguments for an effective design for national EQ-5D valuation studies. *Health Economics, 15*, 1121-32.

Laurenssen, E.M., Hutsebaut, J., Feenstra, D.J., Bales, D.L., Noom, M.J., Busschbach, J.J.V., & …Luyten, P. (2014) Feasibility of mentalization-based treatment for adolescents with borderline symptoms: A pilot study. *Psychotherapy, 51*, 159-166. doi: 10.1037/a0033513

Levy, K.N. (2005). The implications of attachment theory and research for understanding borderline personality disorder. *Development and Psychopathology, 17*, 959–986.

Levy, K.N., Becker, D.F., Grilo, C., Mattanah, J.J., Garnet, K.E., Quinlan, D.M., & … McGlashan, T.H. (1999). Concurrent and predictive validity of the personality disorder diagnosis in adolescent inpatients. *American Journal of Psychiatry, 156*, 1522-1528.

Livesley, W.J., Jang, K.L., & Vernon, P.A. (1998). Phenotypic and genetic structure of traits delineating personality disorder. *Archives of General Psychiatry, 55*, 941-948.

Lofgren, D.P., Bemporad, J., King, J., Lindem, K., O'Driscoll, G. (1991). A prospective follow-up study of so-called borderline children. *American Journal of Psychiatry, 148*, 1541-1547.

National Institute for Health and Care Excellence (2009). Borderline personality disorder: Recognition and management clinical guideline. London: NICE.

Newton-Howes, G., Clark, L.A., Chanen, A.M. (2015). Personality disorder across the life course. *Lancet, 385,* 727-734.

Rathus, J.H., & Miller, A.L. (2002). Dialectical behavior therapy adapted for suicidal adolescents.

Suicide and Life Threatening Behaviors, 32, 146-157.

Rossouw, T.I., & Fonagy, P. (2012). Mentalization-based treatment for self-harm in adolescents: A randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 51*, 1304-1313.

Schuppert, H.M., Giesen-Bloo, J., Gemert, T.G. van, Wiersema, H.M., Minderaa, R.B., Emmelkamp, P.M.G., Nauta, M.H. (2009) Effectiveness of an emotion-regulation group training for adolescents – a randomized controlled pilot study. *Clinical Psychology and Psychotherapy, 16*, 467-478.

Sharp, C., & Fonagy, P. (2015). Practitioner Review: Borderline personality disorder in adolescence-recent conceptualization, intervention, and implications for clinical practice. *Journal of Child Psychology and Psychiatry, 56*, 1266-1288. doi: 10.1111/jcpp.12449

Sharp, C., Pane, H., Ha, C., Venta, A., Patel, A., Sturek, J., & Fonagy, P. (2011). Theory of mind and emotion regulation difficulties in adolescents with borderline traits. *Journal of the American Academy of Child and Adolescent Psychiatry, 50*, 563-573.

Sharp, C., Venta, A., Vanwoerden, S., Schramm, A., Ha, C., Newlin, E., & …Fonagy, P. (2016). First empirical evaluation of the link between attachment, social cognition and borderline features in adolescents. *Comprehensive Psychiatry, 64,* 4-11. doi: 10.1016/j.comppsych.2015.07.008

Stolk, E., Krabbe, P., & Busschbach, J. (2009). Using the internet to collect EQ-5D norm scores: A valid alternative? In J. Busschbach, R. Rabin, & F. De Charro (Eds), *Proceedings of the 24th Scientific Plenary Meeting of the EuroQol Group* (pp 153-165). The Hague, September 13-15 2007.

Trimbos Institute (2008). Multidisciplinary clinical guideline personality disorders. Utrecht: Trimbos Institute.

Tromp, N.B., & Koot, H.M. (2008). Dimensions of personality pathology in adolescents: Psychometric properties of the DAPP-BQ-A. *Journal of Personality Disorders, 22*, 623-638.

Tromp, N.B., & Koot, H.M. (2010). Self- and parent report of adolescent personality pathology: Informant agreement and relations to dysfunction. *Journal of Personality Disorders, 24*, 151-170.

Tromp, N.B., & Koot, H.M. (2015). Psychometric qualities of the Dimensional Assessment of Personality Pathology – Short Form for Adolescents. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology, 3*, 71-79.

Twisk, J.W.R. (2013). *Applied longitudinal data analysis for epidemiology: A practical guide (2nd edition)*. Cambridge: Cambridge University Press.

Verhulst, F.C., Van der Ende, J., Koot, H.M. (1996). *Handleiding voor de CBCL 6-18 (Dutch manual)*. Rotterdam: Sophia Kinderziekenhuis Erasmus MC.

Verhulst, F.C., Van der Ende, J., & Koot, H.M. (1997). *Handleiding voor de Youth Self Report (YSR) (Dutch manual)*. Rotterdam: Sophia Kinderziekenhuis Erasmus MC.

Westen, D., Shedler, J., Durrett, C., Glass, S., Martens, A. (2003). Personality diagnoses in
adolescence: DSM-IV axis II diagnoses and an empirically derived alternative. *American
Journal of Psychiatry, 160*, 952-966.

Figure 1 Flow chart of study population

```
┌─────────────────────────────────────┐
│ N = 143 patients eligible for        │
│ treatment                            │
└─────────────────────────────────────┘
              │
              │        ┌──────────────────────────────────────┐
              ├───────▶│ N = 22 patients declined treatment   │
              │        └──────────────────────────────────────┘
              ▼
┌─────────────────────────────────────┐
│ N = 121 patients started treatment   │
└─────────────────────────────────────┘
              │
              │        ┌──────────────────────────────────────────────┐
              ├───────▶│ N = 3 patients, N = 2 parents refused         │
              │        │ informed consent                              │
              │        └──────────────────────────────────────────────┘
              ▼
┌─────────────────────────────────────┐
│ N = 118 patients included in analyses│
│ N = 119 parents included in analyses │
└─────────────────────────────────────┘
              │                                     │
              ▼                                     ▼
┌─────────────────────────┐          ┌──────────────────────────┐
│ N = 10 early drop outs  │          │ N = 1 early drop out     │
│ N = 7 late drop outs    │          │ N = 1 late drop out      │
└─────────────────────────┘          └──────────────────────────┘
              │                                     │
              ▼                                     ▼
          ┌─────────────────────────────────────────────┐
          │ N = 102 patients completed treatment         │
          └─────────────────────────────────────────────┘
```
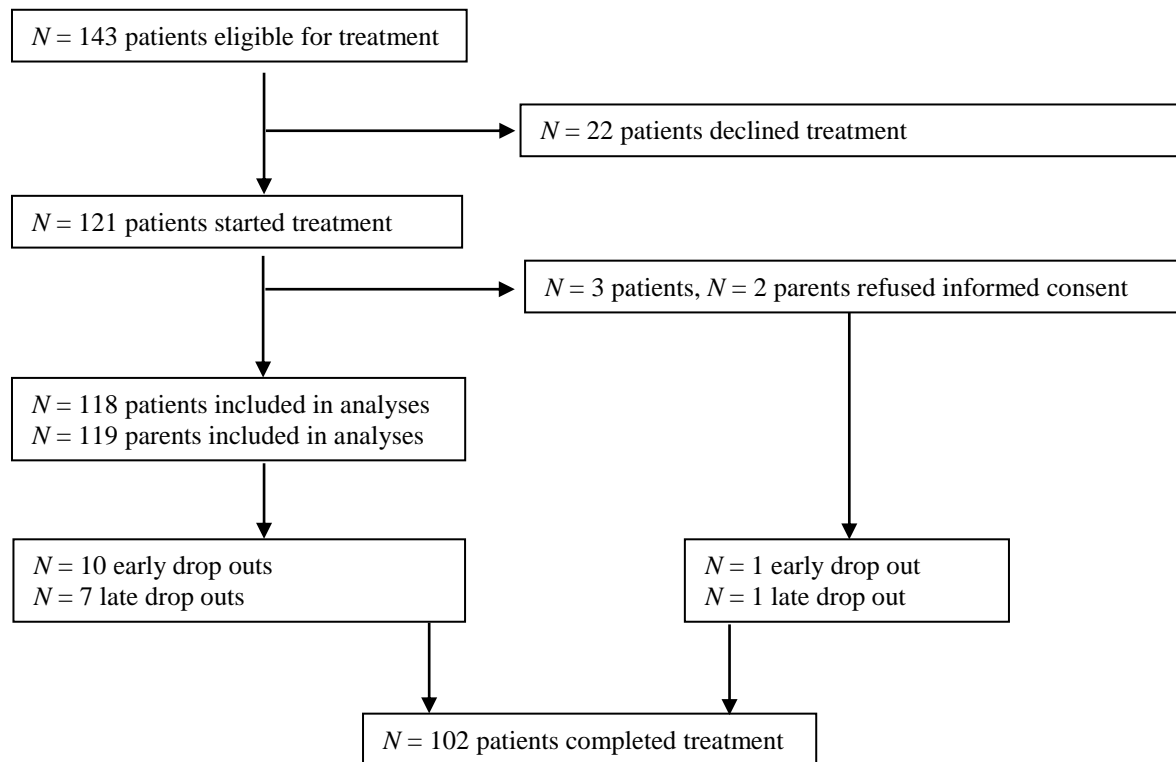
Table 1. Treatment Outcome of MBT-A: General Psychiatric Symptoms at Admission, 6 Months After Admission and Discharge According to Self- and Parent-Report

	Self-Report (YSR/ASR)					Parent-Report (CBCL/ABCL)				
	M	*SD*	*B* (SE)	95% CI	*p*	*M*	*SD*	*B* (SE)	95% CI	*p*
Anxious/Depressed										
T0	76.5	13.2				75.6	11.0			
T1	75.8	13.0	-1.12 (1.21)	-3.50 – 1.25	.354	73.0	11.1	-2.55 (1.17)	-4.84 – -0.26	.029
T2	67.7	14.0	-9.48 (1.46)	-12.35 – -6.62	.000	66.9	11.1	-9.11 (1.40)	-11.86 – -6.36	.000
Effect Size	0.67					0.79				
Withdrawn/Depressed										
T0	70.8	11.4				74.0	11.2			
T1	68.8	11.0	-2.25 (1.16)	-4.51 – 0.02	.052	70.4	10.1	-3.47 (1.05)	-5.53 – -1.41	.001
T2	62.4	11.3	-8.43 (1.32)	-11.02 – -5.84	.000	64.9	10.3	-9.29 (1.20)	-11.65 – -6.94	.000
Effect Size	0.73					0.81				
Internalizing Problems										
T0	72.7	10.0				74.3	7.6			
T1	71.8	10.7	-0.98 (0.96)	-2.86 – 0.90	.305	71.6	8.0	-2.43 (0.85)	-4.10 – -0.76	.004
T2	65.0	13.2	-7.97 (1.33)	-10.57 – -5.37	.000	66.6	10.9	-7.82 (1.20)	-10.16 – -5.47	.000
Effect Size	0.78					1.01				
Total Problems										
T0	67.1	8.7				69.3	6.5			
T1	67.2	9.9	-0.06 (0.81)	-1.65 – 1.52	.936	66.1	7.6	-3.06 (0.74)	-4.51 – -1.61	.000
T2	60.9	11.7	-6.19 (1.12)	-8.38 – -4.00	.000	61.3	9.5	-8.14 (1.00)	-10.10 – -6.17	.000
Effect Size	0.72					1.24				

Notes. Analyses controlled for gender. B = regression coefficient indicating change compared to T0. Effect sizes are based on the difference between T0 and T2, with standard deviation of the mean score at T0 as denominator. T0 = before admission, T1 = 6 months after admission, T2 = at discharge.

Table 2. Clinical Importance of Statistical Significance on General Psychiatric Symptoms									
	Self-Report (YSR/ASR)					Parent-Report (CBCL/ABCL)			
Scale	Criterion A (%)		Criterion B (%)			Criterion A (%)		Criterion B (%)	
	admission	discharge	admission	discharge		admission	discharge	admission	discharge
Anxious/Depressed	0.0	8.3	23.3	39.3		3.7	11.1	20.4	43.1
Withdrawn/Depressed	0.0	0.0	39.7	66.7		1.9	8.3	35.2	70.8
Internalizing Problems	4.3	16.7	25.0	47.6		2.8	26.4	14.8	44.4
Total Problems	2.6	20.2	35.3	57.1		2.8	27.8	21.3	59.7
Note. Criterion A constitutes a score (at admission and discharge respectively) $\geq$ 2 SD below the mean score at admission. Criterion B constitutes a score (at admission and discharge respectively) within 2 SD from the mean in a non-clinical population.									

Table 3. Treatment Outcome of MBT-A: Personality Pathology at Admission, 6 Months After Admission and Discharge According to Self- and Parent-Report										
	Self-Report (DAPP-SF-A)					Parent-Report (DAPP-SF-P)				
	M	*SD*	*B* (SE)	95% CI	*p*	*M*	*SD*	*B* (SE)	95% CI	*p*
Identity Problems										
T0	3.37	0.79				3.42	.70			
T1	3.25	0.86	-.093 (.081)	-.250 – .065	.251	3.21	.68	-.217 (.068)	-.351 – -.084	.001
T2	2.72	0.97	-.634 (.099)	-.829 – -.439	.000	2.76	.74	-.674 (.091)	-.852 – -.495	.000
Effect Size	0.83					0.95				
Affective Instability										
T0	3.41	0.96				3.78	.86			
T1	3.41	0.93	.020 (.069)	-.116 – .156	.768	3.54	.80	-.217 (.071)	-.357 – -.078	.002
T2	2.84	0.98	-.516 (.100)	-.711 – -.321	.000	3.19	.80	-.563 (.102)	-.762 – -.364	.000
Effect Size	0.59					0.68				
Self Harm										
T0	2.82	1.29				2.93	1.17			
T1	2.77	1.28	-.010 (.099)	-.204 – .185	.923	2.66	1.19	-.285 (.094)	-.469 – -.101	.002
T2	2.12	1.28	-.659 (.131)	-.915 – -.403	.000	2.26	1.11	-.724 (.122)	-.963 – -.486	.000
Effect Size	0.55					0.58				

Notes. Analyses controlled for gender. B = regression coefficient indicating change compared to T0. Effect sizes are based on the difference between T0 and T2, with standard deviation of the mean score at T0 as denominator. T0 = before admission, T1 = 6 months after admission, T2 = at discharge.

Table 4. Clinical Importance of Statistical Significance on Personality Pathology Dimensions							
	Self-Report (DAPP-SF-A)					Parent-Report (DAPP-SF-P)	
Dimension	Criterion A (%)		Criterion B (%)			Criterion A (%)	
	admission	discharge	admission	discharge		admission	discharge
Identity Problems	1.8	23.2	42.0	65.9		3.8	19.7
Affective Instability	2.7	2.4	65.2	79.3		1.9	8.2
Self Harm	0.0	0.0	40.2	68.3		0.0	0.0

Note. Criterion A constitutes a score (at admission and discharge respectively) ≥ 2 SD below the mean score at admission. Criterion B constitutes a score (at admission and discharge respectively) within 2 SD from the mean in a non-clinical population.

Table 5. Treatment Outcome of MBT-A: Quality of Life at Admission, 6 Months After Admission and Discharge According to Self- and Parent-Report										
	Self-Report (KIDscreen-27-A)					Parent-Report (KIDscreen-27-P)				
	M	*SD*	*B* (SE)	95% CI	*p*	*M*	*SD*	*B* (SE)	95% CI	*p*
Physical Well-Being										
T0	34.41	7.87				31.90	7.35			
T1	36.08	8.84	1.90 (0.89)	0.14 – 3.65	.034	33.55	6.84	1.76 (0.80)	0.20 – 3.32	.027
T2	38.73	7.40	4.55 (0.92)	2.76 – 6.35	.000	36.40	6.99	4.49 (0.91)	2.70 – 6.28	.000
Effect Size	0.55					0.61				
Psychological Well-Being										
T0	32.01	8.26				30.33	5.90			
T1	34.51	6.96	2.61 (0.93)	0.79 – 4.42	.005	32.23	5.38	2.01 (0.76)	0.53 – 3.49	.008
T2	38.53	8.11	6.71 (1.07)	4.62 – 8.80	.000	37.76	7.10	7.23 (1.21)	4.85 – 9.60	.000
Effect Size	0.79					1.26				
Autonomy & Parent Relation										
T0	45.20	6.48				44.71	6.30			
T1	44.11	8.29	-1.24 (0.86)	-2.92 – 0.44	.149	43.46	4.39	-1.50 (0.58)	-2.65 – -0.36	.010
T2	45.30	7.17	0.25 (0.79)	-1.30 – 1.79	.755	45.10	5.46	0.40 (0.61)	-1.16 – 1.24	.948
Effect Size	0.02					0.06				
Social Support & Peers										
T0	38.70	12.80				38.92	8.86			
T1	41.09	10.39	2.25 (1.43)	-0.54 – 5.05	.114	40.54	7.14	1.59 (1.00)	-0.37 – 3.56	.112
T2	45.33	8.83	6.42 (1.42)	3.64 – 9.20	.000	43.88	5.59	4.36 (0.88)	2.63 – 6.09	.000
Effect Size	0.52					0.56				
School Environment										
T0	35.46	11.59				33.22	10.26			
T1	39.37	9.17	4.31 (1.32)	1.73 – 6.89	.001	40.03	7.15	6.59 (1.15)	4.34 – 8.84	.000
T2	42.58	9.72	6.80 (1.30)	4.26 – 9.35	.000	37.63	8.55	4.12 (1.56)	1.06 – 7.17	.008
Effect Size	0.61					0.43				
	Self-Report (EQ-5D)									
	M	*SD*	*B* (SE)	95% CI	*p*					
Single Summary Index										
T0	0.45	0.28								
T2	0.65	0.27	0.03 (0.006)	0.02 – 0.05	0.000					
Effect Size	0.70									
Notes. Analyses controlled for gender. B = regression coefficient indicating change compared to T0. Effect sizes are based on the difference between T0 and T2, with standard deviation of the mean score at T0 as denominator. T0 = before admission, T1 = 6 months after admission, T2 = at discharge.										

Table 6. Clinical Importance of Statistical Significance on Quality of Life									
	Self-Report (KIDscreen-27-A)					Parent-Report (KIDscreen-27-P)			
Dimension	Criterion A (%)		Criterion B (%)			Criterion A (%)		Criterion B (%)	
	admission	discharge	admission	discharge		admission	discharge	admission	discharge
Physical Well-Being	1.7	5.3	72.0	89.3		2.8	5.8	70.4	76.8
Psychological Well-Being	2.5	8.0	55.9	78.7		1.9	13.0	49.1	66.7
Autonomy & Parent Relation	5.1	5.3	94.9	94.7		3.7	1.4	94.4	88.4
Social Support & Peers	0.8	0.0	78.8	93.3		0.0	1.4	81.5	85.5
School Environment	0.8	2.7	67.8	85.3		0.9	1.4	59.3	66.7
	Self-Report (EQ-5D)								
	Criterion A (%)		Criterion B (%)						
	admission	discharge	admission	discharge					
Single Summary Index	4.5	9.9	40.5	77.8					

Note. Criterion A constitutes a score (at admission and discharge respectively) ≥ 2 SD above the mean score at admission. Criterion B constitutes a score (at admission and discharge respectively) within 2 SD from the mean in a non-clinical population.