Predicting Change in Emotional and Behavioural Problems during Inpatient Treatment in Clients with Mild Intellectual Disability

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Background Little is known about client characteristics that are related to outcome during inpatient treatment of adults with mild intellectual disability (ID) and severe behavioural problems.

Method We explored variables that were related to a change in behavioural problems in 87 individuals with mild ID during inpatient treatment in facilities for adults with mild ID and severe behavioural problems. Emotional and behavioural problems were measured using the Adult Behaviour Checklist (ABCL) and relationships between a change in ABCL total scores and other variables (e.g., age, adaptive skills, and presence of personality disorder) were explored.

Results For the sample as a whole, we found a decrease in emotional and behavioural problems within a 1-year period of inpatient treatment (following a 3-month observation and diagnostic period). Male clients, clients without a personality disorder classification, or clients who showed more improvement in adaptive and social functioning, showed a larger decrease in emotional and behavioural problems than other clients. Gender and personality disorder classification appeared to be the most important predictive factors.

Conclusion Clients with mild ID and severe behavioural problems may benefit from inpatient treatment. Those with a personality disorder and/or female clients may benefit less from such a program. Results of such studies may have consequences for service provision and management. Limitations of this study were the lack of data on the quantity and quality of the treatment package and unknown reliability and validity of Axis-I and personality disorder diagnoses.

Keywords: inpatient treatment, mild intellectual disability, predicting treatment outcome, severe emotional and behavioural problems

Introduction Results from epidemiological studies have shown that behavioural and/or psychiatric problems are common in youth and adults with mild intellectual disability (ID) (e.g., Dekker et al. 2002; Cooper et al. 2007). If untreated, such disorders tend to persist into adulthood (Einfeld et al. 2006). Inpatient treatment may be necessary if a detailed assessment of psychiatric and behavioural problems is required and/or when interventions cannot be carried out in a less restrictive setting (Bouras et al. 1994). Admission to an inpatient setting may occur after a gradual deterioration in behavioural functioning, or it may be precipitated by a sudden and acute episode of violent or aggressive behaviour (Bouras et al. 1994; Raitasuo et al. 1999a). Evaluation of treatment effectiveness and outcome is becoming increasingly important in clinical practice. Furthermore, to allow more targeted interventions, it would be important to know which clients benefit from inpatient treatment and which clients do not benefit or benefit to a lesser extent from such a treatment.

A number of studies have been published on the effectiveness of inpatient treatment services for non-disabled children and adults with severe behavioural and psychiatric disorders. Inpatient outcome studies
have focused on particular psychiatric disorders or problem behaviours (e.g. eating disorder, substance abuse and dependence, personality disorders), target groups (e.g. children, adolescents, adults) and comparative effectiveness whereby inpatient treatment was compared to other treatment models such as partial hospitalization. Recent reviews suggest that inpatient treatment may be effective for individuals with severe psychopathology and that treatment outcome is related to client’s age, his or her severity of psychopathology at intake and staff-client ratios during inpatient treatment (see e.g. Blanz & Schmidt 2000; Gowers & Rowlands 2005).

Only a few studies on the effectiveness of inpatient resources for adults with mild ID have been published yet (e.g. Raitasuo et al. 1999a,b; Xenitides et al. 1999, 2004; Hall et al. 2006). For example, Xenitides et al. (1999) have evaluated the effectiveness of ‘The Mental Impairment Evaluation and Treatment service’ (MIETS), a multidisciplinary assessment and inpatient treatment service for people with mild to moderate ID and severe challenging behaviour. MIETS not only reduced the frequency and severity of behavioural problems in the clients (n = 64), it also resulted in an increase in the percentage of clients who were discharged to community settings instead of to residential settings (i.e. from 17% to 84%). In a related study, Hall et al. (2004) used various instruments in a group of 19 inpatients to evaluate treatment outcome of a specialist inpatient service that was part of a mainstream mental health inpatient service. At discharge, all clients showed substantial improvement in general functioning and reduction in severity of mental health problems.

At present, only little is known about client characteristics and other factors that are related to outcome in adults with mild ID who exhibit severe behavioural problems and/or psychiatric disorders, let alone factors that are related to a positive change in behavioural functioning during inpatient treatment. A small number of studies have shown that the presence of a personality disorder is associated with poorer treatment outcome (see e.g. Tyrer & Simmonds 2003; Lindsay 2006). Furthermore, inverse relationships between level of adaptive and social skills and behavioural and emotional problems are found (see e.g. Matson et al. 2000). It may then be hypothesized that an improvement in adaptive and social skills is associated with a reduction in behavioural problems during inpatient treatment. The aim of the present study was to explore variables that were related to a change in behavioural problems in a sample of clients (n = 87) with mild ID that received inpatient treatment in facilities for adults with mild ID and severe behavioural problems. Emotional and behavioural problems were measured using the ABCL (Achenbach & Rescorla 2003; Tenneij & Koot 2007) and relationships between changes in ABCL total scores and other variables (e.g. age, adaptive skills, presence of personality disorder) were explored.

**Method**

**Setting and participants**

The study was conducted in five Dutch treatment facilities (cooperating within ‘De Borg’ foundation) for adults with mild ID and severe behavioural and emotional problems. In the Netherlands, these facilities have a regional function, that is, persons with mild ID are referred to these specialized facilities if treatment in general mental health institutions and/or residential settings remain ineffective. The primary purposes of admission are to establish a multidisciplinary psychiatric or behavioural diagnosis and to improve behaviour by inpatient treatment and rehabilitation. A comprehensive multidisciplinary assessment (i.e. a three-month’s diagnostic phase) is provided, followed by inpatient treatment. For each client, a social and therapeutic (i.e. sociotherapeutic) environment is created, in which adaptive skills are improved and demands placed upon the client are adapted to her/his level.

Multidisciplinary team meetings are held regularly (once in 3 months on average), in which the client’s treatment is discussed and team members are given feedback and counselling. Next to a sociotherapeutic environment, therapies are offered based on individual’s needs and type of disorder or problem behaviour (e.g. aggression). Therapies may be behavioural and psychological (e.g. cognitive behavioural therapy, social skills training, vocational training, psycho-education), and/or pharmacological. Special attention is given to the generalization of therapeutic effects to the daily therapeutic environment. Following treatment, clients are discharged in community settings and treatment plans, developed at the inpatient setting, are transferred to these settings.

A total of 87 clients were included in this study. They were admitted from a variety of settings, such as residential facilities, prisons, own home or parental home. The sample of 87 clients consisted of 64 men and 23 women. Their average age at baseline was 25.9 years (SD = 7.7). Mean time on ward at baseline was 76.3 weeks (SD = 121.4), with 33 clients (37.9%) receiving
treatment for more than 52 weeks at baseline. Most clients (91.9%, n = 86) were unmarried. Each client had previously received inpatient and/or outpatient treatment, and 50% (n = 86) of the sample was admitted involuntarily to the facility. Thirty-seven clients (44%, n = 84) had a forensic history; they had been convicted at least once in their life. Average total WAIS-III IQ of clients (n = 28) for whom these data were available was 66.4 (SD = 9.1). For the other clients, results of various other IQ tests were available, and their average total IQ was 75.4 (SD = 11.8).

Measures

**DSM-IV axis-I disorder and personality disorder**
Psychiatric axis-I DSM-IV disorders were assessed with an adapted version of the *DSM-III-R Checklist* (Hudziak *et al.* 1993). Presence or absence of a DSM-IV axis-I disorder was rated by either a psychiatrist or a clinical psychologist responsible for the client’s treatment. Four broad categories were distinguished: (i) pervasive developmental disorder, (ii) attention-deficit and disruptive behaviour disorder, (iii) any other DSM axis-I disorder, and (iv) no classification. For the classification of DSM-IV personality disorders we followed a similar procedure. Presence or absence of all DSM-IV personality disorder criteria were rated by the same psychiatrist or clinical psychologist who also rated the DSM-IV axis-I checklist. DSM-IV classifications were established either at the start of the study (i.e. for clients already receiving treatment at the start of the study), or 3 months after admission (i.e., for clients who were admitted during the study). In another study, we found that the diagnostic information obtained with the DSM-IV axis-I checklist showed systematic relations with another measure of psychopathology, viz. the Adult Behaviour Checklist (Achenbach & Rescorla 2003), as an indicator for its convergent validity (Tenneij & Koot 2007).

**Adaptive functioning**
The *Sociale Redzaamheidsschaal voor Zwakzinnigen* (SRZ-P) is a modified version of the Cain-Levine Social Competency Scale (Cain *et al.* 1963). It is widely used in the Netherlands and Dutch speaking regions of Belgium to assess the level of adaptive and social functioning in persons with ID. Two primary care staff members completed the scale after discussion with each other. The SRZ-P results in a total score, with higher scores indicating higher adaptive and social functioning. Test-retest reliability, inter-rater reliability, and internal consistency of the SRZ-P have been found to be sufficiently high (Kraijer 2000; Kraijer & Kema 2004).

**Behavioural and emotional problems**
Emotional and behavioural problems were assessed with the ABCL (Achenbach & Rescorla 2003). The ABCL consists of 118 behaviour problem items. These were evaluated for the preceding 3 months by a primary care staff member who knew the subject well. Behaviour problem statements are scored on a three-level rating scale (i.e., ‘not true’, ‘somewhat true’, and ‘very true’) and a total score may be calculated. The ABCL is a reliable and valid measure in the general population (Achenbach & Rescorla 2003). Recently, we found preliminary evidence for the reliability and validity of the ABCL in adults with mild ID and severe challenging behaviour (Tenneij & Koot 2007).

**Procedure**
Data were collected between January 1st 2004 and January 1st 2006. We included only clients who were present for at least 15 months during the study (i.e. for three assessments following a three-month diagnostic and observational period). – see below for details of the timing of these.

All clients receiving inpatient treatment during this period (i.e. n = 117) were assessed and 82% (i.e. n = 96) gave their written informed consent. For nine clients at least one assessment with the ABCL was missing, which resulted in a total of 87 clients of whom all data were available for analyses. The use of standardized information collected during admission of clients for research purposes was approved of by the review boards of the participating facilities.

All information, with the exception of IQ data in some cases, was collected at the facilities after admission and during treatment, by informants involved in the primary care and treatment of clients in these facilities. Staff members and therapists had been given training in how to use the instruments. The staff member who rated the ABCL also rated the SRZ-P, albeit in consultation with another staff member who also knew the client well. Informants were unaware of the precise aims of the study to prevent bias when completing the scales.

ABCL data were collected at (i) Baseline, (ii) T2 (6 months after baseline) and (iii) Follow-up (12 months
after baseline). SRZ-P data were collected at Baseline and Follow-up. All other information was assessed at Baseline.

**Statistical analyses**

When measuring change in scores between two time points, there is a tendency of extreme scores to show regression to the mean. That is, extreme scores on a first assessment may show more change on a second assessment compared to scores that were less extreme (in terms of deviations from the mean) on a first assessment. To account for this, we used residual change score analysis to assess changes in ABCL total scores between Baseline and Follow-up assessment 1 year later. We used linear regression analysis to predict the degree of change in the sample as a whole \((n = 87)\). The difference between the predicted score and the actual follow-up ABCL total score for each client constituted the ABCL residual change score. The residual change score indicates whether the observed degree of change for a given client was larger or smaller than the change predicted linearly by his or her total score at the first assessment (i.e. Baseline). A positive residual change score indicates that a client has less emotional and behavioural problems at Follow-up than expected; a negative residual change score indicates that a client has more emotional and behavioural problems at Follow-up than expected. Similarly, for the SRZ-P a residual change score was calculated for change in adaptive functioning from Baseline to Follow-up assessment.

With repeated measures analyses, the effect of time was examined for the ABCL (time: Baseline, T2, and Follow-up) and SRZ-P (time: Baseline and Follow-up) scores. The relationships between ABCL residual change score and other variables (i.e., age, gender, personality disorder classification, axis-I classification, SRZ-P at Baseline and SRZ-P residual change score) were examined with correlation and ANOVA. To establish which (combination of) variables contributed to a model to explain variance in ABCL residual change scores, a stepwise regression analysis was performed with all variables related to ABCL residual change score in previous analyses. For each variable, a forward selection procedure with a 5% level of significance was used to include variables in the model. As the time between admission and Baseline assessment could differ across clients (but was at least three months), we controlled for time in ward at Baseline in all analyses.

| Table 1 Mean (SD) SRZ-P score at Baseline and Follow-up and mean (SD) ABCL total scores at Baseline, T2, and Follow-up |
|--------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                        | \( \bar{X} \)     | \( \bar{X} \)     | \( \bar{X} \)     | \( \bar{X} \)     | \( \bar{X} \)     |
| SRZ-P Baseline          | 32.74 (11.90)    | 36.56 (10.40)    | 93.63 (31.83)    | 88.18 (32.00)    | 82.51 (29.41)    |
| SRZ-P Follow-up         | 32.74 (11.90)    | 36.56 (10.40)    | 93.63 (31.83)    | 88.18 (32.00)    | 82.51 (29.41)    |
| ABCL Baseline           | 84              | 84              | 84              | 84              | 84              |
| ABCL T2                 | 84              | 84              | 84              | 84              | 84              |
| ABCL Follow-up          | 84              | 84              | 84              | 84              | 84              |

Note: T2, 6-months after baseline assessment; Follow-up, 12 months after baseline assessment; of three clients the ABCL assessment at T2 was missing, of two clients the SRZ-P assessment at follow-up was missing, SD, standard deviation, ABCL, Adult Behaviour Checklist.

**Results**

**Change in emotional- and behavioural problems (ABCL) and adaptive and social functioning (SRZ-P) from baseline to follow-up**

Mean scores of the ABCL at three time points (Baseline, T2, Follow-up) and SRZ-P at two time points (Baseline and Follow-up) are depicted in Table 1. Repeated measures analyses with ABCL total scores showed a main effect for time, \( F(1,82) = 9.45, P < 0.01 \). Subsequent analyses showed a difference between Baseline and Follow-up scores \( (P = 0.02, \text{Bonferroni correction}) \) indicating that a reduction in emotional and behavioural problems as assessed with the ABCL had occurred in our sample of clients. In Table 1, mean total Baseline and Follow-up scores of SRZ-P are shown. We found a main effect for time, \( F(1,83) = 17.91, P < 0.001 \), indicating that clients also showed a significant improvement in their adaptive and social functioning during inpatient treatment.

**Relationship between ABCL residual change scores and classification of DSM-IV disorders**

Four broad categories of a DSM Axis-I disorder were distinguished and such information was available for 80 clients. Of this group, 26 clients received no classification, 17 clients were classified as having pervasive developmental disorder, 16 clients had an attention-deficit and disruptive behaviour disorder, and 21 clients had another DSM-IV axis-I disorder, such as mood disorder (5 clients), psychotic disorder (8 clients), and substance dependence (9 clients).

To examine whether diagnostic group was related to the ABCL residual change score, we performed a
One-way ANOVA with ABCL residual change score as dependent variable and diagnostic group as a factor (no classification; pervasive developmental disorder; attention-deficit and disruptive disorder; other classification). There was no significant main effect for diagnostic group, $F(3,75) = 1.32, P = 0.28$. It was concluded that type of axis-I classification was unrelated to a change in emotional and behavioural problems from Baseline to Follow-up.

Presence of a Personality disorder (PD) was assessed in the same 80 clients. Of this subsample, 53 clients received no PD classification, 18 clients received a PD classification (13 clients antisocial PD, 5 clients borderline PD), and in 9 clients classification of PD was postponed (i.e. we were unable to make a reliable diagnosis at that particular point in time). Seven of the 26 clients without a classification of any axis-I disorder, were classified as having a PD. Eleven of the 54 clients with an axis-I disorder, were also classified with a PD.

A significant difference in ABCL residual change score was found between clients with a PD (mean residual change score $= -16.69, SD = 27.75$) and those without a PD (mean residual change score $= 3.36, SD = 27.26$), $F(1,68) = 7.11, P = 0.01$. The observed mean ABCL residual change score in the PD group indicates that in this group more emotional and behavioural problems were observed at Follow-up than could be expected.

### Relationship between ABCL residual change scores and age, gender, and adaptive and social functioning

Partial correlation coefficients were calculated whereby time between admission and Baseline assessment, and association between ABCL residual change scores and Baseline SRZ-P residual change scores were controlled for. ABCL residual change score was related to the SRZ-P residual change score ($r = 0.31, P < 0.01$), indicating that clients that showed a reduction in emotional and behavioural problems also showed an improvement in adaptive and social functioning. There was no relationship between change in ABCL scores and Age ($r = 0.18$) and Baseline SRZ-P scores ($r = 0.06$).

ABCL residual change scores for males (i.e. 3.57, SD = 28.12) were significantly higher than change scores for females (i.e. $-9.37, SD = 26.46$), $F(1,84) = 4.37$, $P = 0.04$. At Follow-up, male clients had fewer problems as assessed with the ABCL than expected, in contrast to female clients who had more emotional and behavioural problems than expected at Follow-up.

### Table 2 Regression coefficients and t-values of the contributing predictors of explained variance in ABCL residual change scores ($n = 71$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE_B$</th>
<th>$t$-value $p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>-0.01</td>
<td>0.03</td>
<td>-0.63</td>
</tr>
<tr>
<td>duration at baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD classification</td>
<td>-20.58</td>
<td>7.38</td>
<td>-2.79</td>
</tr>
<tr>
<td>Gender</td>
<td>-15.39</td>
<td>7.44</td>
<td>-2.08</td>
</tr>
</tbody>
</table>

Note: $B = $ regression coefficients; $SE_B = $ standard error of regression coefficients; $β = $ standardized regression coefficients. ABCL, Adult Behaviour Checklist; PD, personality disorder.

### Models for predicting ABCL residual change scores

To establish which combination of the variables contributed to a model to explain variance in ABCL residual change scores, we performed stepwise multiple linear regression analyses ($P < 0.05$ to enter) with the variables that showed a significant relationship with the ABCL residual change score in previous analyses as predictor variables, that is, SRZ-P residual change scores, gender, and presence/absence of PD. To control for ‘time on ward at Baseline assessment’, this variable was forced into each model first before entering the other variables. Results of the regression analyses with ABCL residual change score are shown in Table 2.

When time in ward at Baseline, PD classification, and gender were included in a model, SRZ-P residual change scores did not contribute to explained variance in the ABCL residual change score. The model presented in Table 2 explained 11% of the variance in ABCL difference scores, with PD classification as the main contributor (7%). On the basis of outcomes of the regression analyses, it may be concluded that ‘absence of PD’ and ‘being male’ predict a reduction in behavioural and emotional problems in our sample of clients who have received inpatient treatment (of at least 1 year) in De Borg facilities.

### Discussion

In the present study, we examined which client characteristics were associated with a change in emotional- and behavioural problems observed during a period of one year of inpatient treatment. During the study period, we found a decrease in emotional and behavioural problems as measured with the ABCL after one year of inpatient treatment. However, not all clients showed a reduction in emotional and behavioural problems.
Analyses with the ABCL residual change scores showed that male clients, clients without a PD classification, and/or clients who showed more improvement in adaptive and social functioning, were more likely to show a decrease in emotional and behavioural problems than other clients. Personality disorder classification and gender appeared to be the most important predictive factors. When these variables were put in a model, change in adaptive functioning did not contribute to the explained variance in the ABCL residual change score. Change in emotional and behavioural problems were unrelated to type of psychiatric axis-I classifications and baseline level of adaptive and social functioning. This lack of association between psychiatric axis-I disorders and treatment outcome of multidisciplinary inpatient treatment was also found by Xenitides et al. (1999). They did not find any relation between psychiatric axis I disorders and treatment outcome defined by accommodation status after discharge.

Personality disorder (PD) has a high profile in general psychiatry. Yet, PD and its relationship with treatment outcome in ID is a relatively neglected subject (Tyrer & Simmonds 2003; Lidher et al. 2005; Lindsay 2006). The validity of the diagnosis itself in individuals with ID has been questioned (Alexander & Cooray 2003; Lindsay 2006). Studies showing exceptionally high prevalence rates for personality disorders in persons with ID (e.g., Goldberg et al. 1995; Flynn et al. 2002) have raised questions about its clinical usefulness in ID (Naik et al. 2002). However, for individuals in the general population, the importance of PD is described as determining both the management and prognosis of the psychiatric illness and treatment (Pilgrim & Treacher 1992). Recently, Lidher et al. (2005) showed that the classification of PD might be relevant for individuals with ID as well. That is, individuals with ID who had PD and who lived in the community were more likely to receive central nervous system drugs, be in contact with psychiatric services, and show more psychiatric problems, than individuals without a PD. The results of the present study imply that the classification of PD is relevant for the prognosis of the effectiveness of inpatient treatment. We found the group of clients with a PD diagnosis (23% of the sample, and most of them classified as antisocial PD) to benefit less from 1-year inpatient treatment, as expressed in a reduction of emotional and behavioural problems, than clients without a PD. If future studies replicate these findings, it will be important to develop strategies to cope with this type of co-morbidity in inpatient settings. It should be noted that psychiatric classification was made prior to prolonged treatment and that the assessment itself was not based on knowledge concerning responsiveness to inpatient treatment.

Results of the present study showed that changes in adaptive and social behaviour during inpatient treatment were related to changes in emotional and behavioural problems. That is, more improvement in adaptive functioning was associated with a greater reduction of emotional and behavioural problems. This result may have important implications for the development of inpatient treatment programs in that treatment should be focused on the improvement of social skills and social competence. In a community sample of adults with moderate to mild ID, Matson et al. (2000) investigated the relationship between psychopathology and adaptive and social behaviour, and they found that the greater the degree of impairment in adaptive skills, the greater the degree of psychopathology present. Our results, however, do not allow for drawing definite conclusions on how to interpret the relationship between psychopathology and adaptive functioning. Do these changes go hand in hand, do changes in adaptive functioning precede changes in emotional- and behavioural problems, or vice versa? This question remains to be addressed in future studies.

At least three limitations of this study should be mentioned. First, data on the quantity and quality of treatment across and within facilities were not collected. Thus, we do not know which treatment features were responsible for the (absence of) effectiveness. Related to this, the question whether inpatient treatment is less effective for clients with mild ID and PD or whether treatment is not yet optimally tailored to these clients remains unanswered. Recent studies have shown that general mental health services are effective at treating non-disabled individuals with PD (e.g. borderline, anti-social) (for a recent meta-analysis, see Leichsenring & Leibing (2003)).

Second, a small number of clients were discharged from the treatment facility within the study period of 15 months of inpatient treatment. These clients were not included in our study as only one or two assessments of these clients were then available. Clients could be discharged for several reasons, for example, because they voluntarily and unilaterally withdrew from the treatment program or because they were discharged from the clinic after attaining the goals of treatment. It is unclear if and in what way this client sample was different from our study sample. Third, reliability and validity of axis-I and personality disorders are unknown. To standardize DSM axis-I and Personality disorder classification we used a checklist to integrate clinical
information. The validity of this approach has been documented in several studies (e.g. Hudziak et al. 1993).

Results of our study suggest that clients with severe behavioural problems may benefit from inpatient treatment. Despite an increasing emphasis on community care, inpatient treatment remains necessary for a number of individuals with mild ID. In the Netherlands, a variety of treatment models are available for clients with mild ID who have behavioural and/or psychiatric disorders. Depending on the severity of such problems, treatment may take place on inpatient or outpatient basis. Mild problems may be treated on an outpatient basis and several options are available such as day treatment (partial hospitalisation) and outpatient treatment and community-based challenging behaviour teams. If behavioural and/or psychiatric symptoms are severe and/or if treatment in these less restrictive settings remains unsuccessful, clients may be admitted to specialist units within psychiatric hospitals or treatment facilities such as 'De Borg' facilities.

Future studies should not only address effectiveness of inpatient treatment, but also should be focused on characteristics of clients who benefit much less from inpatient treatment. Alternative treatment models should be sought for these clients and service provision should be tailored to their needs. Future multi-site studies on inpatient treatment effectiveness should not only investigate features responsible for its effectiveness, they should also collect data concerning the quantity and quality of treatment as well as cost-benefit evaluations.

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