Age of onset of disruptive behavior of residentially treated adolescents

Boer, S.B.B. de

Chapter 4

Treatment outcome of adolescent inpatients with early-onset and adolescent-onset disruptive behavior

Sjoukje B.B. de Boer
Albert E. Boon
Fop Verheij
Marianne C.H. Donker
Robert Vermeiren

Journal of Clinical Psychology, 2017, 73 (4), 466-478.
(DOI) 10.1002/jclp.22341

Abstract

Objective: Unlike adolescents with adolescent-onset (AO) disruptive behavior, adolescents with early-onset (EO) disruptive behavior may not benefit from treatment. **Method:** Using Symptom Checklist (SCL-90-R) ratings at admission and discharge of adolescent inpatients with EO (n=85) and AO (n=60) disruptive behavior treatment outcome was determined by (a) a change in mean scores, and (b) the Reliable Change Index. For a subgroup, ratings on the Satisfaction Questionnaire Residential Youth Care for Parents (TOR-J) (n=83) were used to verify the treatment outcome. **Results:** Inpatients with EO disruptive behavior had a higher risk of dropout (44.4%) from treatment than the AO group (24.7%). Among the treatment completers, both onset groups reported improvements on the SCL-90-R, with 26.9% recovering and 31.7% improving. Inpatients who reported improvement were mostly rated as improved by their parents (*r*=.33). **Conclusion:** As EO inpatients are more likely to drop out, interventions should aim at motivating youngsters to continue treatment, particularly given the poor outcome in this group. Treatment may benefit both groups, because those EO youths who stayed in treatment improved to the same extent as AO inpatients.

Keywords: Adolescent psychiatry, Early-onset, Adolescent-onset, Disruptive behavior, Treatment outcome, SCL-90-R

Introduction

In an attempt to explain disruptive behavior, several theoretical models have been posited, among which the developmental theory of Moffitt (1993). Compared to others, this theory offers an extra dimension because it explains patterns of disruptive behavior over the course of an individual's life. Several studies have, however, questioned the usefulness of the developmental theory for clinical practice (Fairchild et al., 2013; López-Goñi, Fernández- Montalvo, Illescas, Landa, & Lorea, 2008; Vermeiren, 2003).

In epidemiological research, Moffitt (Moffitt, 1993, 2003) found that a small part of the population (6.2%) engaged in disruptive behavior at a very young age, which was likely to persist later on. This group was labeled life-course-persistent (LCP). A larger group (23.6%), labeled as adolescence-limited (AL), involved in disruptive behavior only during adolescence. During adolescence the groups did not differ in frequency and severity of criminal offending, although it was argued that they differed in etiology, developmental course, prognosis, and classification of their behavior as either normative or pathological (Fergusson et al., 2000; Moffitt, 1993, 2003; Moffitt et al., 2008; Moffitt & Caspi, 2001). Most studies on trajectories of disruptive behavior were consistent with the taxonomy of Moffitt (Aguilar et al., 2000; Barnes & Beaver, 2010; Bongers, Koot, Van der Ende, & Verhulst, 2004; Broidy et al., 2003; Dandreaux & Frick, 2009; Fairchild et al., 2013; Fergusson et al., 2000; Fontaine et al., 2009; Jennings & Reingle, 2012; Kratzer & Hodgins, 1999).

Initially, it was suggested that LCP individuals were less likely to benefit from treatment once their conduct problems had persisted into adolescence (Moffitt et al., 1996). The assumption that LCP individuals are untreatable does not comply with the view of most therapists. More recently, Moffitt adjusted her assertions and argued that in adolescence both LCP and AL groups need intervention, although they require different intervention goals and approaches (Moffitt et al., 2008). Because individuals on the LCP antisocial behavior pathway have an increased risk to encounter social and mental health problems later in life (e.g., Bardone, Moffitt, Caspi, Dickson, & Silva, 1996), developing effective interventions for this group carries clinical and societal relevance.

To date, not much is known about the effectiveness of treatment of adolescents with specifically LCP and AL disruptive behavior. Existing knowledge on the effectiveness of interventions targeting childhood onset disruptive behavior in clinical practice is predominantly based on studies with a younger population (e.g., Beauchaine et al., 2005; Hawes, Dadds, Brennan, Rhodes, & Cauchi, 2013). Although both the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994) and the *International Classification of Diseases 10th revision* (ICD-10; World Health Organization, 2010) Conduct Disorder classifications included specifiers based on the distinction between childhood and adolescent onset, this has seldom been applied to treatment of adolescents. This is unfortunate, since differentiation in subgroups may result in more individualized and appropriate intervention and, consequently, better treatment results (Vermeiren, 2003).

The aim of the present study is thus to examine the treatment outcomes of adolescent inpatients with early-onset (EO) versus adolescent-onset (AO) disruptive behavior, who received residential treatment in a specialized facility for youths with severe behavioral problems. It was hypothesized that the outcome of treatment for individuals with EO disruptive behavior would be less satisfactory because their problems are enduring and have higher likelihood of being persistent. Interestingly, the assumption that individuals with EO disruptive behavior have worse prospects or may even be "therapy-resistant" has never been tested in clinical practice. The terms EO and AO were used because the course of the adolescent inpatients' future disruptive behavior is as yet unknown. Adolescents diagnosed with severe disruptive behavior who also displayed this behavior during childhood, were labeled as EO. We expect that these adolescents are at increased risk of becoming LCP group members. Thus, although EO and LCP are not equivalent, EO is a risk factor for LCP. The inpatients with severe disruptive behavior who did not display disruptive behavior during childhood, were labeled as AO. Adolescents in this group will presumably develop as those in the AL group, even though it is not guaranteed that AO is equivalent to AL.

Methods

Setting

The present study was conducted at a specialized residential treatment facility in Rotterdam (the urban area) in The Netherlands, for youth with severe disruptive behavior (i.e., aggressive, oppositional defiant, delinquent, and/or rule breaking behavior), and comorbid psychiatric disorders. Inclusion criteria for treatment were as follows: aged between 16 and 20 years and displaying a combination of disruptive behavior, comprising aggressive behavior (e.g., physical abuse, sexual offences), oppositional behavior (e.g., disobedience), status offences (e.g., truancy, substance abuse), and property violations (e.g., stealing, vandalism) that is severe enough to require treatment.

In addition, a (combination of) psychiatric disorder(s) (e.g., schizophrenia, mood disorder, anxiety disorder, autism spectrum disorder), and previous (a history of) treatment by child welfare institutions or child and adolescent psychiatric institutions were required. Patients functioning below borderline intellectual level (IQ<70), with predominant addiction problems, or with severe recurrent criminal conduct for which specialized, individual forensic treatment is indicated, were not eligible for treatment. All youngsters that met the inclusion criteria and have been admitted to the treatment were included in this survey.

Because of the heterogeneous composition of the target group, every subject had a personalized treatment program. The treatment itself was mainly offered in a group context. A cognitive-behavioral treatment model was applied with an emphasis on enhancement of social competence (Bartels, 2001), extended with elements of the schema-based therapy (Young, 1990; Young et al., 2004). Because many of the youngsters come from disharmonious parenting situations, therapists also focused on a good, functional working relationship with the family system (Boon & Haijer, 2008). Following new insights, the treatment program evolved during the 14-year period that it was provided, and inevitably some changes in therapists did occur. The treatment program was conducted by qualified therapists and consisted of a variety of verbal and nonverbal therapies and training activities, e.g., cognitive behavioral therapy, psycho-motor therapy, art therapy, drama therapy, family therapy, social skills training, aggression regulation training, pharmacological treatment, job training, and education

(e.g., Hornsveld, 2004; Muller & Colijn, 1999). The training activities emphasized, for instance, the unlearning of aggressive behavior and the acquiring of behavior alternatives. Also, de-escalation schedules were used to record individualized agreements on learning to deal with aggression (Boon & Haijer, 2008).

Measures

To describe the sample, information was gathered from interview, file review, and therapist questionnaire. The biodemographical information was gathered on standardized forms used in the context of ongoing program evaluation research conducted at the facility. These forms were based on common formats used in the Netherlands (e.g., classification according to Centraal Bureau voor de Statistiek, the national institution that centralizes the collection, processing and publication of statistics for government, science and industry).

To capture the relevant behavior characteristics as comprehensive as possible, this information (e.g., criminal offending, substance usage) was obtained from more than one source.

Interview

Research assistants interviewed patients on characteristics (e.g., sociodemographic information, substance usage, and criminal offending). Most characteristics were coded present, absent or unclear.

File review

Current DSM classifications were collected from patient files. The attending psychiatrist made these DSM classifications during the course of treatment, which were based on direct evaluations of the subjects. Research assistants, psychology students in the final year of their master, who were trained and supervised by the researcher, collected the classifications from file. They screened the files on age at admission, ethnicity (native Dutch/non-native), intellectual ability (IQ), social economic status (indicated by the highest occupational level of the parents), criminal offences, substance usage, and duration of treatment.

Therapist questionnaire

To assess relevant patient variables (e.g., substance use, criminal offending), therapists filled out a questionnaire based on information they gathered directly from the patients, parents and the referring professional (e.g., guardian or probation officer) during the intake procedure.

At discharge, therapists indicated how the treatment was terminated: (a) termination recommended or supported by the therapist, (b) patient was expelled, (c) treatment was aborted by the patient (e.g., ran away), or (d) another reason (e.g., patient was arrested, deceased).

Distinction in the onset of disruptive behavior

Presence of disruptive behavior during childhood was determined based on the age when treatment was sought for disruptive behavior, or when special education was indicated due to this behavior, and the age at which the youngster started to commit criminal offences. The disruptive behavior was categorized according to the framework of Frick and colleagues (Frick et al., 1993), and included aggression (e.g., physical abuse, sexual offences), oppositional behavior (e.g., disobedient), status offences (e.g., truancy, substance abuse), and property violations (e.g., stealing, vandalism) (De Boer et al., 2013; De Boer et al., 2012; Frick et al., 1993). The main researchers made the distinction in the EO and AO groups. For each patient the presence and age of onset of disruptive behavior were determined based on information from file and the interview. Disruptive behavior was considered present when it was mentioned by at least one of the sources. When no information was available, it was coded as unclear (or missing, depending on the reason for unavailability).

The earliest age reported by any source was used as the age of onset. Subsequently, patients with disruptive behavior starting prior to age 12 were considered belonging to the EO group, and those whose disruptive behavior started from age 12 on were considered belonging to the AO group (De Boer et al., 2013; De Boer et al., 2012; De Boer et al., 2007). Using age 12 as the cut-off was in accordance with Moffitt (Moffitt, 1993; Moffitt et al., 1996) and with Dean, Brame and Piquero (1996), who found that differences between the EO and AO groups were only evident

when the threshold was set at age 12. We determined the interrater reliability (Cohen's Kappa .79) by calculating the correlation among ratings, independently done by two researchers, on a random subset of the sample (n=11).

Discharge status

Discharge status was determined by the researcher and was based on length of treatment and the way treatment was terminated according to the therapist involved. Intended duration of treatment was at least half a year. This resulted in two groups of patients: those who terminated treatment positively (i.e., termination in accordance with the therapist, and length of treatment ≥ 6 months), and those who terminated treatment negatively (i.e., termination not in accordance with the therapist and/or length of treatment < 6 months).

Treatment outcome

Treatment outcome was measured with the Symptom Checklist Revised (SCL-90-R; Arrindell & Ettema, 2003), and for a subgroup with the "treatment result" scale of the Satisfaction Questionnaire Residential Youth Care for Parents (TOR-J; Boon et al., 2010).

The SCL-90-R is a standardized self-report questionnaire for the assessment of psychological and related physical problems and is often used in evaluation research (e.g., Arrindell & Ettema, 2003; Arrindell et al., 2003; Boon & Colijn, 2001; Boon & De Boer, 2007; Bruinsma & Boon, 2001; Grünwald & Von Massenbach, 2003). When applied at admission and discharge, change in psychological and physical complaints during treatment can be assessed (e.g., Arrindell et al., 2003; Boon & De Boer, 2007). Originally, the instrument was developed for adult populations. Over the last decades, the instrument has increasingly been applied to adolescent populations as well (Biegel, Brown, Shapiro, & Schubert, 2009; Biskin, Paris, Renaud, Raz, & Zelkowitz, 2011; Boon & Colijn, 2001; McGough & Curry, 1992), including adolescent inpatients with severe behavioral problems (Boon & De Boer, 2007; Bruinsma & Boon, 2001).

Each item is rated on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (extremely) to indicate the severity of the symptom over the past week. The global total score constitutes a Global Severity Index (GSI), which was used in the study to

report changes between admission and discharge. The GSI has good reliability (Arrindell & Ettema, 2003) and has become one of the most widely used measurements of psychological distress (Holi, 2003; Prinz et al., 2013).

The TOR-J (Boon et al., 2010) is a self-report questionnaire for parents to assess satisfaction with their child's treatment in (semi) residential mental health care facilities. The TOR-J consists of 17 items that are rated on a 5-point scale ranging from 1 (*does not apply to me*) to 5 (*does apply to me*). The instrument yields scores on three main scales (transference of parental care, treatment result, and parent guidance), and a total scale. The total scale has moderate validity (convergent r = .29, divergent r = .05 and .03) and good reliability (internal consistency α = .95, test-retest reliability r = .78; Boon et al., 2010). In the present study, only the main scale "treatment result" was used. This scale represents the extent to which the youngster has improved during treatment from the perspective of the parents.

Procedure

During a 14-year period (1995-2009), all newly admitted patients were approached to participate in the study. According to legislation and the institution's policy, ethical approval has been obtained prior to the research. After a verbal description of the study to the subjects, written informed consent was obtained. All patients (n=234) agreed to participate and in concordance with the institutional policy, they participated without receiving incentives or rewards.

The SCL-90-R (Arrindell & Ettema, 2003) was administered at intake (T0), admission (T1) and discharge (T2). It is known that repeated measurements with the SCL-90-R cause a not yet adequately explained test-retest effect between the first time it is applied and a second measurement at any given time (Arrindell, 2001; Koeter, Ormel, & Van den Brink, 1988), wherein the second measurement (usually a lower score) should be regarded as the most representative. Therefore, in order to overcome the (possible) test-retest effect, T0 was applied only to obviate this effect and T1 was used as the baseline score. Outcome was presented in two different ways: (a) change in mean scores between admission and discharge, and (b) number of inpatients that recovered, improved, remained stable, or deteriorated between admission and discharge according to the reliable change index.

At discharge the TOR-J (Boon et al., 2010) was administered to parents to verify their opinion of the treatment outcome compared to the youngsters' assessments (i.e., SCL-90-R). This was done because the use of self-report instruments like the SCL-90-R within samples diagnosed with severe disruptive behavior may not yield reliable scores in juvenile delinquent samples (Breuk, Clauser, Stams, Slot, & Doreleijers, 2007), because they are subject to under-reporting and errors of memory (Moller, Tait, & Byrne, 2012). On the other hand, Crowley, Mikulich, Ehlers, Whitmore, and MacDonald (2001) found that although some patients minimized their symptoms, youths' self-reports significantly discriminated patients from controls in DSM-IV conduct disorder and they concluded that patients' self-reports (of conduct disorder) had good discriminative validity.

Overall, treatment outcome may vary across types of respondents (adolescent, parent, or therapist) or instruments. The proportion showing improvement, for instance, may differ across measures, and the measures may vary on which individuals improve (Rosenblatt & Rosenblatt, 2002). Moreover, the reliability of self-report inventories for measuring constructs such as psychopathology has been found to increase from childhood through adolescence (Frick, Barry, & Kamphaus, 2009; Kamphaus & Frick, 2002). Parent reports often disregard the adolescent's own perspective. Covert acts and internalizing behavior, for example, are generally obscure to third-party informants.

Statistics

All analyses were performed using SPSS (version 18.0; 2009). Chi-square tests were used to examine differences between categorical variables and *t*-tests (two-tailed) were used to examine differences between responders and nonresponders regarding age, and length of treatment and between the EO group and the AO group on the SCL-90-R total score (GSI), and the TOR-J score "treatment results". When TOR-J scores of both parents were available, the average of those scores was used. Improvement on the GSI of the EO and AO group was examined using mixed between-within subjects analysis of variance (ANOVA). Also, correlations (Pearson product-moment) were used to relate SCL-90-R treatment outcome to TOR-J "treatment results".

To determine clinically significant change, the Reliable Change Index was used on the GSI. Clinically significant change has been defined as "the extent to which therapy moves someone outside the range of the dysfunctional population or within the range of the functional population" (Jacobson & Truax, 1991, p. 12). The improved index for individual reliable change (RCINDIV) introduced by Hageman and Arrindell (1999) was used. The retest reliability of the norm group's scores (Boon & De Boer, 2007) was used to calculate the standard error of measurement (SE) and the cut-off point type C. Patients with RCINDIV < -1.65 were considered "improved" and those with RCINDIV > +1.65 were considered "deteriorated". Patients with a RCINDIV between -1.65 and +1.65 were categorized as "no reliable change." Patients with a reliable change (RCINDIV < -1.65) whose scores were above the cutoff point at T1 and below this point at T2, were considered "recovered". All other patients were classified as showing "no clinically significant change".

To control for possible differences in population and treatment over the course of 14 years (i.e., the natural design in which patients enrolled in the treatment program at different times), the sample was divided in three cohorts of patients admitted during 1995-1998 (n=44), 1999-2002 (n=47) and 2003-2008 (n=54). To check for changes over time, an ANOVA was performed on the following variables: age at admission, number of previous admissions, length of treatment, GSI at admission.

Results

All 234 inpatients admitted in the residential facility between 1995 and 2009 were approached to participate in the research, 145 of whom participated at both initial assessment and follow-up. For 211 (90.2%), the age of onset of disruptive behavior was determined; 203 (96.2%) completed the SCL-90-R at admission and 145 patients (145/211 = 68.7%) at discharge.

Nonresponse at admission (n=8) was mainly caused by patients who were unable to fill in the questionnaire, e.g., because of active psychotic symptoms. Nonresponse at discharge (n=66) was mainly due to drop out (patients who ran away and could not be traced) or refusal. Two patients committed suicide during treatment. No significant differences were found between the nonresponders and the final sample on sex, age, duration of treatment, and SCL-90-R score at admission. Table 1

describes the 145 patients included in the study. The sample comprised 39 female and 106 male patients with a mean age of 17.7 years at admission. Although the level of intelligence (mostly measured at the institutions that requested admission) of the sample was average (IQ=100.1, SD=13.0, n=109), compared to the general Dutch population, the educational attainment was relatively low. In addition to their psychiatric problems, all patients in the sample displayed severe disruptive behavior.

Table 1 shows the characteristics by EO and AO classification. Compared to the AO group, significantly more youths in the EO group were males (χ^2 (1, *N*=145) = 6.81, *p*=.009). Both groups differed significantly on the age of onset of the disruptive behavior (*t*(141.9) = -21.21, *p*<.000), and in the number of DSM diagnoses (Axis I) (*t*(143) = 2.34, *p*<.021), with the EO group showing significantly more often a diagnosis of conduct disorder (χ^2 (1, *N*=145) = 5.63, *p*=.018). No significant differences were noted between the groups on other diagnostic categories.

Table 1

Characteristics of the sample (n=145)

		Total n=145		Early-onset (EO) n=85		Adolescent-onset (AO) n=60	
	N[1]	n	(%)	n	(%)	n	(%)
		Mean	(SD)	*Mean*	(SD)	*Mean*	(SD)
Characteristic							
Sex (male)	145	106	(73.1%)	69	(81.2%)	37	(61.7%)
Age (years)	145	*17.7*	(1.2)	*17.6*	(1.1)	*17.8*	(1.2)
Ethnicity Dutch	145	111	(76.6%)	67	(78.8%)	44	(73.3%)
IQ	109	*100.1*	(13.0)	*99.7*	(12.3)	*100.7*	(14.1)
Highest occupation of both parents (SES)	136						
No		13	(9.6%)	6	7.6	7	12.3
Without qualification		11	(8.1%)	5	6.3	6	10.5
Low qualification		29	(21.3%)	21	26.6	8	14.0
Intermediate qualification		63	(46.3%)	36	45.6	27	47.4
High qualification		20	(14.7%)	11	13.9	9	15.8

SD = standard deviation;

[1] Number of patients for whom information about the characteristic was available

Significantly more patients with EO disruptive behavior dropped out of the treatment, i.e., 44.4% of the EO group versus 24.7% of the AO group (χ^2 (1, *N*=211) =

8.53, *p*=.003). Many were nonresponders (i.e., failing to complete the SCL-90-R at discharge; 78.0% of the EO nonresponders dropped out versus 48.0% of the AO nonresponders). No significant difference was found in nonresponse between the EO group (32.5%) and the AO group (29.4%).

Mean change

To check for changes over time, the three cohorts of patients (i.e., those admitted between 1995-1998, 1999-2002, and 2003-2008) were compared on age at admission, number of previous admissions, length of treatment, and GSI at admission. Of these variables only length of treatment showed significant changes over time: for cohort 1995-1998, the length of treatment was 481 days; for cohort 1999-2002, it was 603 days; and for cohort 2004-2008, it was 443 days. The difference between the middle and the last cohort was significant (*F* (2, 143) = 4.68, *p*=.011). The other variables showed no significant differences, with *F* values ranging from 0.45 to 2.61.

Table 2

Comparison between *T-score*s of the total group on SCL-90-R total score at admission and discharge

n=145	Measurement	*M*	(SD)	t (df), *p*	ES
SCL-90-R total score	Admission	152.14	*(61.42)*	2.51 (144), *.007*	.20
	Discharge	139.84	*(61.01)*		

M = mean; SD = standard deviation; df = degree of freedom; SCL-90-R = Symptom Checklist 90 Revised; ES = Effect size (Cohen's d)

Paired *t*-tests (one-tailed) for outcome results were performed for the total group (n=145). The differences in T-scores between admission (T1) and discharge (T2) on the GSI are shown in Table 2. The effect size (Cohen's *d*) between T1 and T2 for the total score was small.

Next, a mixed between-within subjects ANOVA was conducted to assess outcome on the GSI for the EO and the AO groups between the two time periods (admission and discharge). There was no significant interaction between onset group and time period, Wilks Lambda = 1.00, *F* (1, 143) = .07, *p*=.80, partial eta squared = .000. There was a small main effect for time period, Wilks Lambda = .97, *F* (1, 143) =

4.20, *p*=.042, partial eta squared = .029, with both groups showing a reduction on the total problem score between admission and discharge (see Table 3).

The main effect comparing the EO group with the AO group was not significant, *F* (1, 143) = 2.21, *p*=.140, partial eta squared = .015, suggesting no differences in outcome between the onset groups.

Table 3

SCL-90-R Total-scores of the EO and AO groups at admission and discharge

n=145			EO			AO	
	Measurement	n	*M*	SD	n	*M*	SD
SCL-90-R	Admission	85	*143.92*	56.17	60	*163.80*	66.94
	Discharge	85	*133.51*	52.07	60	*148.82*	71.31

M = mean; SD = standard deviation; df = degree of freedom; SCL-90-R = Symptom Checklist 90 Revised; EO = early-onset; AO = adolescent-onset

At discharge, parents involved in the treatment of their child were sent a TOR-J. Because the TOR-J was introduced in October 1997, parents of 22 patients have not received a questionnaire because their child was already discharged. Besides, five patients had no parents involved. Therefore, the TOR-J was sent to 113 parents. Of them, 83 (73.5%) completed and returned the questionnaire. The relationship between treatment outcome on the GSI and the TOR-J "treatment results" scale was examined using Pearson product-moment correlation coefficient. There was a weak but positive correlation between both variables (*r*=.33, n=83, *p*=.002).

Clinical significance of change

To reveal how many patients deteriorated or recovered during treatment, the procedure of clinically significant change was used, to examine whether the patients post-test scores crossed the cutoff point toward better functioning (Jacobson & Truax, 1991). Based on the mean and standard deviation of the normal population, the true difference and the true post-score were calculated. At discharge, the majority of the sample (58.6%) had recovered or improved (GSI; see Table 4).

Subsequently, to control for the staggered design, a chi-square analysis was performed between the three time cohorts (1995-1998, 1999-2002, and 2003-2008) and the categories of clinical significant change of the GSI (i.e., recovered, improved,

no reliable change, and deteriorated). No significant changes were found over time (χ^2 6, N=145) = 5.72, p=.46).

Table 4

Comparison between EO and AO groups of clinically significant change between admission and discharge on the SCL-90-R total-scores

Change from pre- to posttreatment	Outcome	EO n	EO %	AO n	AO %	Total n	Total %	χ^2(df), p
SCL-90-R total score	Recovered	24	28.2	15	25.0	39	26.9	*2.8* (3), *.42*
	Improved	24	28.2	22	36.7	46	31.7	
	No reliable change	13	15.3	12	20.0	25	17.2	
	Deteriorated	24	28.2	11	18.3	35	24.1	
	Total	85	100.0	60	100.0	145	100.0	

df = degree of freedom; SCL-90-R = Symptom Checklist 90 Revised; EO = early-onset; AO = adolescent-onset

When the EO and AO groups were considered separately, both groups showed similar percentages of reported improvement or recovery. This was confirmed by the TOR-J results of the parents, which showed that according to parents, 71.4% of the EO group (score ≥ 6) and 68.3% of the AO group improved. Because not all parents had returned the TOR-J questionnaires, chi-square analysis was performed to verify whether the ones returned came predominantly from one parent group (e.g., AO group) versus the other (e.g., EO group). Significantly more TOR-J questionnaires came from parents of the AL group (p=.036); 69.5% of the parents of the AO group returned the TOR-J questionnaire compared to 51.9% of the parents of the EO group.

Discussion

The purpose of this study was to examine treatment outcome of adolescent inpatients with EO and AO disruptive behavior. Based on epidemiological research, individuals on the LCP pathway were suggested to be 'therapy-resistant' (Moffitt, 1993, 2003; Moffitt et al., 1996) or in need of more intensive intervention (Moffitt et al., 2008). However, these assumptions have never been tested in clinical practice. Therefore, it was hypothesized that adolescent inpatients with AO disruptive behavior would have better treatment outcome than those with EO disruptive behavior. Our study showed that EO youths tended to end treatment prematurely more often than

the AO youths. It thus seems that the EO group is more problematic compared to the AO group in terms of treatment adherence.

In itself this is not a surprising finding; EO youngsters are probably more inclined to lack the necessary support from their social environment and may thus feel less supported to complete treatment. Moreover, most of the EO patients already had a long treatment history that so far had little success. This will certainly have had an impact on the expectations of the patients regarding their treatment. Future research should be conducted on the relationship between EO disruptive behavior and dropout.

Patients of the EO group who stayed in treatment improved to the same extent as patients with AO disruptive behavior. Thus, for this selective group, no support was found for the hypothesis. More than half of both onset groups reported improvement or recovery during treatment, which was for most confirmed by their parents. This conclusion should be treated with caution, because parents of the EO group had a lower response rate than those of the AO group. It is likely that this difference in response rate relates to the severity of the problems (and etiological differences) of the EO group.

The finding that there were no differences in treatment outcome between the onset groups may be caused by several factors. Possibly the AO group responded less well on treatment because they were negatively influenced by the EO group. Besides, both onset groups (and not just the EO group) were highly problematic, because in addition to disruptive behavior, they were also affected by psychiatric disorders. Undoubtedly, this had an effect on the treatment outcomes of both groups. Maybe the EO group responded better to the treatment than may be expected because the environmental risk was eliminated by the admission. However, being admitted in an institution likely exacerbates problems (e.g., there is a concentration of juvenile delinquents to learn from, causing more environmental risks to arise).

Furthermore, the EO group staying in treatment may be a selective group that is more susceptible to interventions, which in part may explain why no differences were found between the onset groups. Also, all patients had a history of previous (unsuccessful) treatment. Therefore, the AO group members could not be considered the “promising candidates for intervention programs” where Moffitt was referring to (Moffitt et al., 1996). Maybe some of them belonged to the subgroup of patients with

AO disruptive behavior that persists into adulthood, as described by Odgers (Odgers et al., 2008). The fact that a proportion of both groups did improve during treatment, might be because of the intensive, highly specialized, tailored treatment that was provided.

Another potentially important factor is the manner in which the constructs were operationalized. Collins and Vermeiren (2013), for instance, indicated that EO and AO can be operationalized in different ways and that outcomes may vary depending on whichever operationalization is applied. Inherent limitations in the operationalization of the (retrospective) EO and AO reporting and the (prospective) LCP and AL group differentiation may have influenced our ability to confirm the hypotheses. It cannot be ruled out that some AO group members were actually members of the EO group. For instance, some AO group members might have committed crimes for which they were not prosecuted because they had not yet reached the age of criminal responsibility (Van Domburgh, Vermeiren, et al., 2009). When these crimes and their onset were also not reported during the study, the actual age of onset of the disruptive behavior may have been earlier than reported.

However, some children who have committed a single offence do not exhibit concurrent or persistent disruptive behavior. It has, for instance, been found that many childhood first-time arrestees did not re-offend (within 2 years) and about two third of them were not diagnosed with an externalizing disorder (Moffitt et al., 2002; Van Domburgh, Loeber, Bezemer, Stallings, & Stouthamer-Loeber, 2009). It is thus possible that some of the patients in our study have committed a single offense at a young age, while actually starting worrisome disruptive behavior from adolescence on. Also, recall bias cannot entirely be ruled out, leading to an overestimation of early disruptive behavior.

Limitations

Findings of this study need to be considered in light of some limitations. First, because the EO and AO groups had additional and often multiple psychiatric problems, they must be considered as a specific subsample of the groups described by Moffitt (Moffitt, 1993; Moffitt et al., 2008). It is very likely that the psychiatric disorders and disruptive behavior interact with each other, and because there was a variety of

psychiatric problems, the sample should be considered heterogeneous. We therefore do not know to what extent the treatment adherence and treatment results were influenced by the comorbid psychiatric disorders. We recommend extending future research to larger groups and examining the effect of specific disorders and comorbidity. Further, a standardized instrument (e.g., Structured Clinical Interview for DSM-IV Axis I Disorders; Spitzer, Gibbon, & Williams, 1998) to reliably assess the psychiatric disorders should be used. Such an instrument was not used in the present study and although the psychiatrists involved have diagnosed conscientiously, this should be seen as a limitation.

Second, because of the naturalistic design with absence of a control group, it is not possible to determine which part of the outcome was attributable to the treatment. Besides, changes in treatment program did occur over time because of experience and new insights. Also, during the 14-year period there were changes in therapists, which obviously must have affected the treatment and hence the treatment outcome. Also, it is not clear what outcomes were in the long term, because no follow-up data were examined.

Third, it would have been informative if specific disruptive behaviors had been assessed over the course of the treatment. Unfortunately, there is a lack of instruments that can be used to measure changes in specific disruptive behaviors in a reliable way. Obviating this by assessing change in externalizing problems between admission and discharge, for example through the Child Behavior Checklist or Youth Self Report (Achenbach & Rescorla, 2001), would also encounter problems. It has been found that the majority of adolescents with disruptive behavior do not report high levels of externalizing problems on such instruments (e.g., Vreugdenhil, Van den Brink, Ferdinand, Wouters, & Doreleijers, 2006).

Querying the parents in this sample would also have created difficulties, because only a portion of them had sufficient insight into how their child was functioning. Prior to the admission, many youngsters have not lived with their parents for a long time. Besides, parents may have been reluctant to cooperate or would be difficult to reach, as was found in research among conduct disordered samples (Colins et al., 2012).

Conclusion

In patient groups with severe disruptive behavior (e.g., juvenile delinquents, adolescents with conduct disorder), it is important to distinguish between those whose disruptive behavior started before age 12 (EO group) and those starting at the age of age 12 on (AO group), because the EO group is at a significantly higher risk to drop out from treatment. EO group members who do stay in treatment, however, do improve during treatment to the same extent as patients with AO disruptive behavior. It is finally worth emphasizing that a substantial number of adolescents of the LCP group, that is often considered untreatable, is likely to change over time, possibly because of intensive treatment.