Age of onset of disruptive behavior of residentially treated adolescents

Boer, S.B.B. de

Chapter 6

Treatment adherence and general daily functioning at follow-up in youths with severe disruptive behavior

Sjoukje B.B. de Boer
Albert E. Boon
Anna M. de Haan
Robert Vermeiren

Manuscript submitted for publication.

Abstract

Objective: As follow-up research focuses predominantly on patients who completed treatment, we lack information on outcomes of treatment dropouts. Therefore, general daily functioning was examined of former inpatients (n=196) of a psychiatric institution specialized in treatment of youth with severe disruptive externalizing. **Method:** Regression analyses were used to assess whether completion of treatment could predict general daily functioning at 18 months follow-up. Additionally, the influence of early-onset (i.e., prior to age 12) disruptive behavior, cannabis usage prior to admission and male sex was examined. **Results:** Treatment completion (versus dropout) was the best predictor for good general daily functioning at follow-up. Early-onset disruptive behavior, cannabis usage prior to admission and male sex, added to the explained variance. **Conclusions:** Because treatment dropout related to poorer functioning at follow-up, preventing dropout is clinically relevant. One way to achieve this may be to focus on the reduction and prevention of drug use.

Keywords: Follow-up, Dropout, General daily functioning, Residential adolescent psychiatry, Antisocial behavior

Introduction

Because between a quarter to as much as three quarters of the outpatients terminate treatment prematurely (De Haan et al., 2013), treatment dropout can be considered a major problem in Child and Adolescent Mental Health. Not much however is known about dropout in residential psychiatric care for patients with severe disruptive behavior, albeit a dropout percentage as high as 59.1% was found in one study (Van den Reijen et al., 2013). Assuming that accurate treatment reduces symptoms and improves functioning, these findings suggest that a considerable number of patients may not benefit fully from evidence based psychiatric interventions. Children and adolescents with untreated behavioral problems have poor prospects. They are more likely to leave school without a qualification, to engage in delinquent activities more often, to abuse drugs and alcohol, and to become unemployed as adults, while their disorders might persist or even worsen later in life (De Haan et al., 2013; Moffitt et al., 2002). If premature termination of treatment entails that behavioral problems are left untreated, it may be assumed that patients who drop out are worse off in the period after discharge. To our knowledge, no research has been conducted in which completers and dropouts were compared on the daily functioning in the period after discharge.

Dropout can be an indication of the severity of the problems, as was indicated by Kazdin (1994), who found that children with externalizing problems who dropped out of outpatient treatment showed greater pretreatment impairment at home, school and community compared to completers. They also had greater clinical dysfunction at discharge. Previous research among residential psychiatric inpatients with severe disruptive behavior, the group followed-up in this study (De Boer, Boon, Verheij, Donker, & Vermeiren, 2017), showed that two factors are related to premature termination of treatment, i.e., early-onset disruptive behavior (i.e., exhibiting disruptive behavior prior to age 12; OR 2.9) and cannabis usage prior to the admission (OR 2.1) (De Boer et al., 2017). Therefore in the present study these variables were taken into account, because the relation between treatment adherence and general daily functioning at follow up might be confounded by them. Sex was also included in the analyses, as in previous studies sex differences were found in dropout as well as in

early-onset disruptive behavior (De Boer et al., 2017; De Haan et al., 2013; Odgers et al., 2008).

In residential samples with high incidence of disruptive behavior, the initiative to prematurely terminate treatment may not only lie with the patient (i.e., withdrawal), but also with the therapist (pushout). It has been argued that it is of relevance to distinguish both forms of dropout (Boon & Colijn, 2001; Van den Reijen et al., 2013), because withdrawal may be related to lack of commitment, while pushout will often be the result of incidents. Further, patients may withdraw because they feel that their treatment is completed. In some cases of pushout, the persons involved (e.g., the therapist, the referring agency, or criminal court) may deem it necessary to transfer the patient to another, more restrictive residential facility such as prison. The patient does not necessarily have to agree and may still feel the need of treatment by the expelling institution. This implies that it is of interest to distinguish between two types of dropout.

In the present study, the general daily functioning in the eighteen months following discharge was examined in a sample of former adolescent psychiatric inpatients who had been admitted to a residential institution specialized in youth with psychiatric disorders combined with severe disruptive behavior. Based on what is known about areas of life on which individuals with untreated behavioral problems function worse later in life (De Haan et al., 2013; Moffitt et al., 2002; Odgers et al., 2008; Piquero, Farrington, Nagin, & Moffitt, 2010), good general daily functioning was considered to consist of having daytime activities (education, work), not using substances (alcohol, drugs), abstaining from criminal offending, and stability of the living conditions since discharge. In order to investigate whether dropouts and completers differed in severity of dysfunction at admission and discharge, as was found by Kazdin (1994), the degree of psychological distress of dropouts and completers was compared in the first and last week of the treatment.

To control for its possible effect, early-onset disruptive behavior was included in the analyses. The concepts of early-onset disruptive behavior (i.e., disruptive behavior prior to age 12) and adolescent-onset disruptive behavior (i.e., disruptive behavior after age 11) are based on the extensive longitudinal research of Moffitt and colleagues (Moffitt, 1993; Moffitt et al., 2008; Moffitt et al., 2002; Odgers et al., 2008;

Piquero et al., 2010). Individuals with an early-onset are likely to become life-course-persistent (LCP) offenders, for whom general daily functioning is more compromised than for late onset or Adolescent Limited (AO) offenders. Individuals with LCP have worse mental health, worse physical health, and more economic problems at several assessment occasions (e.g., Moffitt et al., 2002; Odgers et al., 2008). High-rate chronic offenders - who may be considered similar to individuals with LCP disruptive behavior – were also found to have a less satisfactory accommodation and cohabitation history, were less often employed, more often reported fights and offences, had problematic alcohol and drug use, had less satisfactory mental health, and had more convictions (Piquero et al., 2010).

Methods

Setting

The present study was conducted at a residential orthopsychiatric and forensic psychiatric youth facility that offers specialized care for youth with severe disruptive behavior, and co-morbid psychiatric disorders. The disruptive behavior included aggressive, oppositional defiant, delinquent, and rule-breaking behavior. The psychiatric disorders consisted mainly of conduct disorders, oppositional defiant disorder, attention-deficit/hyperactivity disorders (ADHD), autism spectrum disorders, schizophrenia and related disorders, mood disorders, and anxiety disorders. To be eligible for treatment, at admission the youngsters had to meet the following criteria: being in the age of 16 to 20 years, exhibiting severe disruptive behavior as well as psychiatric problems, and having (a history of) previous treatment. Exclusion criteria for treatment were: functioning below borderline intellectual level (IQ <70), and having shown severe recidivist criminal behavior for which specialized forensic treatment was indicated. Drug abuse was no contraindication, nor was it a reason for dismissal. However, being afflicted by predominant addiction problems was a contraindication.

The treatment program of the facility was based on a cognitive-behavioral treatment model with emphasis on enhancement of social competence (Bartels, 2001). Over time, elements of the schema-based therapy were added (Young, 1990; Young et al., 2004). A variety of therapies and training activities were offered, 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.

Participants

All 296 inpatients admitted and discharged during a seventeen year period (1995-2012) were approached to participate. Two had committed suicide during treatment and were therefore excluded. Hence, the total group that was eligible for research comprised of 77 females and 217 males.

Table 1

Characteristics of the sample

N=294	N[1]	n	(%)
		Mean	(SD)
Characteristic			
Sex (male)	196	147	(75.0%)
Ethnicity Dutch	196	147	(75.0%)
Onset of disruptive behavior	175		
Early-onset (< 12 years)		122	(69.7%)
Adolescent-onset (> 11 years)		53	(30.3%)
Cannabis usage prior to admission	196	130	(66.3%)
Age at discharge (years)	196	*19.0*	(1.4)
Discharge status	196		
Completion of treatment		129	(65.8%)
Withdrawal[2]		40	(20.4%)
Pushout[3]		27	(13.8%)
Duration of treatment (days)	196	*444.3*	(283.8)

[1] Number of patients for whom information about the characteristic was available
[2] Premature termination of treatment against the advice of the therapist
[3] Premature termination of treatment against the whishes of the patient

Over sixty percent (60.2%) of these 294 individuals completed the treatment, leaving about forty percent (n=117, 39.8%) of them to be entitled dropout. Of the 294 individuals eventually 196 (66.7%) participated in the follow-up study. The participants (N=196) had a mean treatment duration of 14.8 months (444 days; min. 25 - max. 1481 days) and the majority of them was of Dutch origin (see Table 1).

The 98 non-responders were compared to the 196 participants on the variables used in present study. No significant differences were found on sex, early-onset

disruptive behavior, cannabis usage prior to treatment, or duration of treatment. The non-responders did differ on discharge status: 27.1% of the completers did not participate at follow-up compared to 42.7% of the dropouts (χ^2 (1, N=294) = 7.73; p=.005). Further analysis revealed that the difference between completers and dropouts was almost entirely caused by the pushouts (50.0% did not participate) and not by the withdrawals (non-participation rate of 36.5%).

Procedure

All inpatients admitted from the start of the facility in 1995 were approached to participate in the study. The research was in accordance with Dutch medical ethical research regulation. Information gathered was handled according the regulation of the Personal Data Protection Act (Wet Bescherming Persoonsgegevens). After a personal description of the study to the subjects, written informed consent (asking for the use of their information for research) was obtained according to legislation and the institution's policy. All inpatients agreed to participate and in concordance with the institutional policy, they participated without receiving incentives or rewards. The data were used of those who had been discharged up to and including 2012 (N=294).

According to the study protocol (Bruinsma & Boon, 2001) the measurements were conducted within the first weeks of admission, and one and a half year after discharge (follow-up). Discharge status (i.e., completion and dropout) was determined shortly after discharge. The measurements were conducted by research assistants. These research assistants were psychology students in the final year of their master program, and were trained and supervised by the researcher.

Some of the data originated from patient interview, some was collected through file review and some by self-report instruments. The information was gathered on standardized forms used in the context of ongoing program evaluation research conducted at the facility.

In the first week of the admission, participants were interviewed on socio-demographic information (e.g., sex, age, ethnicity), substance usage (drugs and alcohol) and previous criminal offending. The period for which the information was collected was from birth to admission. To obtain an indication of the psychological functioning, in the first week of the admission and at discharge, participants filled in

the SCL-90-R (Arrindell & Ettema, 2003). The SCL-90-R total score at admission and discharge was used to examine possible differences in the degree of psychological distress at the start and end of the treatment between completers and dropouts. On average, at one and a half year follow-up (*M*=1.51 years, SD=0.69, min. 0.91 - max. 4.55 years), the participants were interviewed on living conditions, daytime activities (e,g., school, work), substance usage, and criminal offending. The period for which the information was collected was from discharge to follow-up. To obtain a fair image of how the participant was doing and to ensure the reliability of the data, the interview at follow-up took place at the residence of the participant.

Besides the patient interview, the research assistants also screened the patient files on age at admission, criminal offences (type, frequency and age at onset), substance usage (type and age at onset), and duration of treatment.

Psychological problems

The Symptom Checklist Revised (SCL-90-R) (Arrindell & Ettema, 2003) is a standardized self-report questionnaire for the assessment of psychological and related physical problems and was initially intended for adult populations. In recent decades, it has become increasingly common to use the questionnaire with adolescent populations as well, including adolescent inpatients with severe behavioral problems (Boon & De Boer, 2007; Bruinsma & Boon, 2001). The SCL-90-R consists of 90 items that can be rated on a five-point Likert scale (“not at all” to “extremely”) to indicate the severity of the symptom over the previous week. The total score is known as the Global Severity Index (GSI), which has good reliability (Arrindell & Ettema, 2003), and has become the most commonly used measure of psychological distress (Holi, 2003; Prinz et al., 2013).

Early-onset of disruptive behavior

Presence of disruptive behavior was based on the age when treatment was sought for disruptive behavior or special education was indicated because of such behavior, or the age at which the youngster started to commit criminal offences. The data with regard to disruptive behavior was collected by research assistants and based on patient interview and file review. To obtain the fullest possible picture, the

therapist involved also inquired about this information with the participant, his parents and the referring professional (e.g., guardian or probation officer) during the intake procedure. The disruptive behavior of the participants was categorized according to the framework of Frick and colleagues (Frick et al., 1993), and included aggression (i.e., homicide attempt, assault, robbery, physical abuse, sexual offences, threatening someone), oppositional behavior (i.e., disobedient, doing things their own way, stubbornness), status offences (i.e., running away, truancy, substance usage), and property violations (i.e., selling drugs, lying, possession of weapons, stealing, setting fires, vandalism, fencing stolen goods, traffic offences).

For each participant the presence and age of onset of disruptive behavior had been determined. Disruptive behavior was considered present when it was mentioned by at least one of the sources (i.e., file, therapist or patient). When no information was available, it was coded as unclear (or missing, depending on the reason for unavailability). Participants with disruptive behavior starting prior to age 12 were considered belonging to the EO group and those whose disruptive behavior started from age 12 as being part of the AO group (De Boer et al., 2013; De Boer et al., 2012; De Boer et al., 2007). The distinction in the early-onset (EO) and adolescent-onset (AO) groups was made by the main researchers and was done independently from the data collection. The interrater reliability (Cohen's Kappa .79) had been determined based on independent ratings by two researchers on a random subset of the sample (De Boer et al., 2012).

Cannabis usage prior to the admission

Data with regard to cannabis usage prior to the admission was collected by research assistants and was based on patient interview and file review. The age at which cannabis was used for the first time as well as the frequency of use was queried. The therapist involved also inquired about this information with the participant, his parents and the referring professional (e.g., guardian or probation officer) during the intake procedure.

Discharge status

Discharge status was determined based on how treatment was terminated according to the therapist involved. In line with the preferred definition of dropout of De Haan and colleagues (De Haan et al., 2013), this resulted in two groups of participants: completers, those who terminated treatment in accordance with the therapist, and dropouts, those who prematurely terminated treatment while the therapist (or the patient) thinks further treatment is actually needed. The latter group was further subdivided into those who terminated treatment against the advice of the therapist (withdrawals), and those who were expelled (pushouts) (Boon & Colijn, 2001).

General daily functioning in the eighteen months after discharge

In order to have an indication of the general daily functioning of the participants in the eighteen months after discharge, four components were distinguished: 'stability of living condition', 'daytime activities', 'substance usage', and 'criminal offending'. Each of the four components was rated (positive = 2, dubious = 1, or negative = 0) by the research assistant. The components combined formed an estimation of general daily functioning, with a score ranging from 0 to 8.

The component 'stability of living condition' was coded as positive when there had been a stable living condition (e.g., living with parents or family, living independently or in sheltered housing), with no more than one or two changes. It was coded as negative when the participant had been incarcerated, had been admitted to a restrictive psychiatric facility or a crisis shelter, in case of having no fixed abode, or when there had been ongoing changes of housing situation. It was coded dubious when there had been more than two changes in housing situation, but the nature of the living conditions in itself was favorable.

Having any kind of 'daytime activities' since discharge was coded as positive. These activities may include work or education, but also volunteer activities or occupational therapy. When the participant had no daytime activities most of the eighteen months or if the daytime activities consisted of committing crimes or other rule violations, this was coded as negative. In the case of alternating having and not having a daytime activity, this was coded as dubious.

The component 'substance usage' was coded as positive when there was no drug use since discharge, if the participant had occasionally used alcohol (not on a regular basis, not more than 1 or 2 drinks per occasion) or sporadically had used cannabis (once or twice a year). Occasional usage of other drugs (e.g., XTC, speed, cocaine, heroin), or regular use of cannabis or alcohol was coded as negative. If there for instance had been a short period of regular use of cannabis or alcohol after discharge, but subsequently it changed for the better resulting in abstinence, this was coded as dubious.

'Criminal offending' was coded as positive if the participant reported that he did not commit any crimes or offences. If there had been violations such as traffic offences, fare dodging or fighting, this was coded as dubious. If the participant reported crimes, offences or violations for which prosecution would be justified, this was coded as negative. It was based on offending that was indicated by the respondent and was rated regardless whether or not persecution actually took place.

Statistical analysis

All analyses were performed using the Statistical Package for the Social Sciences, version 23.0 (IBM, 2015). The inter rater reliability (Cohen's Kappa) of the components of the general daily functioning scale was determined. To compare the completer and dropout groups on the four (categorized) components of general daily functioning, chi-square tests were performed. Independent-samples t-tests were conducted to compare the completer and dropout groups on the quasi-interval variable general daily functioning at follow-up, and on the continuous variables (e.g., GSI at admission and discharge). First, the completers were compared to the dropouts, and because of the assumed difference between withdrawals and pushouts, both dropout groups were also compared with each other. To compare the completer and dropout groups on (dichotomized) categorical variables (cannabis usage prior to admission, early-onset disruptive behavior prior to age 12, and sex), chi-square tests were performed. To investigate the relationship between the dichotomized categorical variables (cannabis usage prior to admission, early-onset disruptive behavior prior to age 12, and male sex) and general daily functioning at follow-up, independent-samples

t-tests were used. A level of significance of $p<.05$ (two-sided) was chosen, with a Holm-Bonferroni correction to account for the number of characteristics tested.

Univariate regression analysis was conducted with discharge status (completer versus dropout), as independent variable, and the general daily functioning score as dependent variable. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Subsequently, to control for the possible effect of cannabis usage prior to treatment, early-onset disruptive behavior, and male sex, these dichotomized variables were each included as independent variables in separate regression analyses. Finally, a multiple regression analysis was performed, in which the discharge status (completer versus dropout), was included as independent variable, and the general daily functioning score as dependent variable, controlling for the possible joint effect of cannabis usage prior to treatment, early-onset disruptive behavior, and male sex. The Nagelkerke R-square of the model was used as measure for effect size.

Results

General daily functioning

Scores on general daily functioning were normally distributed (Skewness = -.58 Kurtosis = -.73), with a mean of 5.3 (range 0-8; SD=2.4). The inter rater reliability (Cohen's Kappa) of the four components by two research assistants on a random subset of the sample (n=15) showed that the inter rater reliability of the 'stability of living condition' was moderate (Cohen's Kappa .55), of 'daytime activities' excellent (Cohen's Kappa .88), and those of 'substance usage' (Cohen's Kappa .64), 'criminal offending' (Cohen's Kappa .75), as well as the sum of the components, 'general daily functioning' (Cohen's Kappa .75), good (Fleiss, 1981).

Completion and dropout

About one third of the 196 participants had dropped out of treatment (34.2%). Completers had a higher score on the general daily functioning scale at follow-up (see Table 2), indicating that in the eighteen months after discharge they functioned better than those who had dropped out.

Table 2

Completers versus dropouts

		Completers (n=129)	Dropouts (n=67)	Completers vs Dropouts
	N[1]	n (%) / *M* (SD)	n (%) / *M* (SD)	*p-value* , ES[2]
Sex (male)	196	94 (72.9%)	53 (79.1%)	*n.s.*
Early-onset disruptive behavior (< age 12)	175	72 (63.2%)	50 (82.0%)	*.010*, phi* = -.20
Cannabis prior to treatment	196	77 (59.7%)	53 (79.1%)	*.006*, phi* = -.20
Duration of treatment	196	*539.7* (271.0)	*260.6* (208.6)	*.000**, Cohens d* = -1.15
General daily functioning at follow up	193	*5.80* (2.19)	*4.16* (2.56)	*.000**, Cohens d* = .69

ES = Effect Size; *n.s.* = not significant

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

* $p < .03$ (two-tailed), significant after Holm-Bonferroni correction (with 2 variables: $p < .03$)

** $p < .000$ (two-tailed), significant after Holm-Bonferroni correction (with 5 variables: $p < .01$)

[2] ES = phi coefficient for 2x2 tables; small = .10 ; medium = .30; large = .50; Cohen's d; small = .20 ; medium = .50; large = .80

Considering the separate components of general daily functioning (see Table 3), completers functioned significantly better than the dropouts on three of the four components ('stability of living condition', 'daytime activities', and 'criminal offending'). Further, completers and dropouts did not differ in the degree of psychological distress (SCL-90-R total score) at the start and end of the treatment. Also, no differences between completers and dropouts were found on the subscales of the SCL-90-R at both measurements.

Early-onset disruptive behavior and the relationship with discharge status and general daily functioning

For 175 of the 196 participants the age of onset of the disruptive behavior could be determined (89.3% of the sample), which resulted in 122 early-onset (122/175 = 69.7%) and 53 adolescent-onset (30.3%) participants. Participants with early-onset disruptive behavior more often dropped out of treatment than participants with adolescent-onset disruptive behavior (χ^2 (1, N=175) = 6.66; p=.01).

At follow-up, no significant difference was found between the mean score on general daily functioning of the early-onset group (M=5.32, SD=2.48) and the adolescent-onset group (M=5.15, SD=2.37) (t (173) = -.42, p=.674). When the separate components of general daily functioning were considered, one significant difference

Table 3

Percentages of positive ratings on the components of general daily functioning of the key variables

	Discharge status (n=196)			Onset of disruptive behavior (n=175)			Cannabis usage prior to treatment (n=196)			Sex (n=196)		
	Dropout (n=67)	Completion (n=129)		EO (n=122)	AO (n=53)		Yes (n=130)	No (n=66)		Male (n=147)	Female (n=49)	
Positive rating	*%*	*%*	*p-value*	*%*	*%*	*p-value*	*%*	*%*	*p-value*	*%*	*%*	*p-value*
Stability of living condition	*47.8*	*76.0*	*.000***	*71.3*	*52.8*	*.018**	*63.1*	*72.7*	*n.s.*	*63.9*	*73.5*	*n.s.*
Daytime activities	*31.8*	*52.7*	*.006**	*49.6*	*37.7*	*n.s.*	*43.4*	*50.0*	*n.s.*	*45.2*	*46.9*	*n.s.*
Substance usage	*43.1*	*54.0*	*n.s.*	*50.4*	*57.7*	*n.s.*	*37.8*	*75.0*	*.000***	*43.4*	*70.8*	*.001**
Criminal offending	*58.2*	*79.8*	*.001**	*69.7*	*79.2*	*n.s.*	*66.2*	*84.8*	*.006**	*68.0*	*85.7*	*.016**

n.s. = not significant; EO = Early-onset (< age 12), AO = Adolescent-onset (> age 11)

* $p < .05$ (two-tailed)

** $p < .000$ (two-tailed)

was found (see Table 3). Participants with EO disruptive behavior more often had a positive rating on 'stability of living condition', indicating that they functioned better compared to participants with AO disruptive behavior.

Cannabis usage prior to admission and the relationship with discharge status and general daily functioning

Two third of the participants had used cannabis prior to admission (see Table 1), which was not associated with early-onset disruptive behavior, nor with duration of treatment. Participants who had used cannabis before admission more often dropped out of treatment (χ^2 (1, N=196) = 7.44; p=.006). Furthermore cannabis usage prior to treatment was associated with a lower score on general daily functioning (M=4.8, SD=2.5 versus M=6.1, SD=2.2) (t (143.65) = 3.57, p=.000) at follow-up. This indicated that cannabis usage prior to treatment might be a confounding factor in the relation between completion of treatment and general daily functioning at follow-up. Table 3 shows that participants who had used cannabis prior to treatment, functioned significantly worse on 'substance usage' and 'criminal offending' at follow-up.

Sex and the relationship with discharge status and general daily functioning

Males and females did not differ on completion or dropout from treatment, or on cannabis usage prior to treatment, nor did they differ on duration of treatment. Males more often displayed disruptive behavior before age 12 (i.e., early-onset disruptive behavior) (χ^2 (1, N=175) = 5.14; p=.023) and more males (94.9%) than females (81.6%) had offended prior to treatment (χ^2 (1, N=294) = 12.66; p=.000). On general daily functioning at follow-up, females had a higher score (M=6.0, SD=2.1) than males (M=5.0, SD=2.5)(t (193) = 2.39, p=.018), indicating that female participants functioned better than the male group. As shown in Table 3, males functioned significantly worse on 'substance usage' and 'criminal offending' at follow-up. No sex differences we found on the other two components.

Withdrawals versus pushouts

No significant differences were found between withdrawals and pushouts on sex, early-onset of disruptive behavior, cannabis usage prior to admission, duration of

treatment, GSI at admission and GSI at discharge, or general daily functioning eighteen months after discharge.

Regression analyses

Completion of treatment significantly predicted general daily functioning at follow-up (F (1, 193) = 22.66, p<.001), explaining 10.1% of the variance.

After controlling for early-onset disruptive behavior, completion of treatment explained 11.0% of the variance in general daily functioning at follow-up (F (2, 172) = 10.65, p<.001).The model with cannabis usage prior to admission as control variable, was statistically significant as well (F (2, 192) = 14.81, p<.001), with 13.4% of the variance explained. When the influence of male sex was taken into account, 12.3% of the variance in general daily functioning at follow-up was explained (F (2, 192) = 13.44, p<.001).

After controlling for the combined influence of early-onset disruptive behavior, cannabis usage prior to admission and male sex, the total variance explained was 17.1%, F (4, 170) = 8.76, p<.001. These factors combined explained an additional 7.0% of the variance in general daily functioning at follow-up (R squared change = .07, F change (1, 170) = 4.78, p=.003). In this model, all variables were statistically significant related to daily functioning, with the exception of early-onset disruptive behavior (which almost reached significance). Discharge status recorded the highest beta value (β = .30, p<.001), followed by cannabis usage prior to treatment (β = -.19, p=.01), male sex (β = -.17, p=.021), and early-onset disruptive behavior (β = .13, p=.066).

Discussion

The present paper reports whether dropout is associated with poorer general daily functioning at follow-up in youth with severe disruptive behavior. To our knowledge this has not been examined before, since follow-up research is usually conducted among patients who completed the treatment. It was found that former patients who completed a treatment for psychiatric disorders and severe disruptive behavior functioned better in the eighteen months after discharge than those who dropped out. This finding remained when controlling for other factors that previously have been associated with dropout.

Compared to previous studies on dropout (De Haan et al., 2013) and in particular a sample that may be considered similar (Van den Reijen et al., 2013), the dropout percentage of 39.8% was low. In studies on dropout of treatment for reducing disruptive behavior, dropouts had more problems, both prior to treatment and at discharge (e.g., Kazdin et al., 1994). Present results indicated that dropouts also functioned worse in the period after discharge and that dropout had a unique relationship with general daily functioning at follow-up. This implicates that, in the treatment of conduct disordered youths, preventing dropout should be an important focus. For instance, individuals with increased risk of dropout could be offered interventions primarily aimed at motivational enhancement, or at enhancing the therapeutic alliance (e.g., De Haan et al., 2013), since this is likely to play a role. Also, an important focus of treatment in conduct disordered youth should be prevention and treatment of substance use. After all, cannabis usage prior to treatment not only predicted dropout, it also affected general daily functioning at follow-up by adding the most variance. In this light, evidence-based treatment modalities such as Multidimensional Family Therapy (MDFT) are recommendable since it simultaneously addresses substance use, delinquency, and antisocial and aggressive behavior.

In conduct disordered youth, it may also be important to discern withdrawal and pushout, as both forms of dropout may need a different approach in order to reduce it. In present study however, no differences were found between those who had withdrawn and those who had been expelled. At least, not on the variables that were examined. This does not necessarily mean that there are no differences between these groups, and more research is indicated.

Since early-onset disruptive behavior predicted dropout (De Boer et al., 2017), and dropout was associated with poorer general daily functioning, one would think that patients with early-onset disruptive behavior would function worse compared to those with adolescent-onset behavior. Especially since other research also showed that individuals with (equivalents of) life-course persistent disruptive behavior performed worse on general daily functioning. Surprisingly we found the reverse. After controlling for cannabis usage prior to admission, male sex and discharge status, patients with early-onset disruptive behavior functioned better at follow-up. This was attributable to the stability of living conditions. Based on the information available, there is no

explanation for this finding. It may be related to the operationalization of early-onset and adolescent-onset disruptive behavior, because retrospective classification increases the probability of a recall bias. In this light, several studies have questioned the usefulness of the developmental theory for clinical practice (Fairchild et al., 2013; Fernández-Montalvo et al., 2008; Vermeiren, 2003). Also, several studies indicate that life-course persistent disruptive behavior is associated with problematic alcohol use, drugs use, more self reported offences, and convictions (e.g., Piquero et al., 2010). This was not replicated, since in present study participants with early-onset disruptive behavior did not differ from those with adolescent-onset disruptive behavior on the components 'criminal offending', and 'substance usage'. An explanation for this could be the specificity of the sample, all were individuals with severe disruptive behavior. It cannot be ruled out that of the individuals whose disruptive behavior started in adolescence, the behavior persists into adulthood.

Although it is unlikely that treatment is by definition useful to everyone that qualifies, at the very least it is important to prevent dropout and its negative consequences for many individuals that are considered eligible. Preventing dropout is likely to result in more (cost) effective care, since daily functioning will be improved in more individuals, resulting in lower costs of care in the future. After all, any treatment that fails costs money while it probably yields nothing. Also, it is likely to serve the public interest. Especially among samples with high incidence of disruptive behavior the stakes are high, because if left untreated, these individuals tend to cause much social turmoil.

Limitations

Findings of this study need to be considered in light of some limitations. First, other factors, that were not included in this study, are important in the relation between dropout, completion of treatment and general daily functioning after treatment (e.g., treatment factors, and patient characteristics, such as personality traits, psychotropic medication use).

Another limitation is the operationalization of general daily functioning. The four components that were used give roughly an indication hereof, however, general daily functioning is a concept that is composed of multiple facets that were not all

taken into account (e.g., the level of functioning in a social network, having a partner relationship).

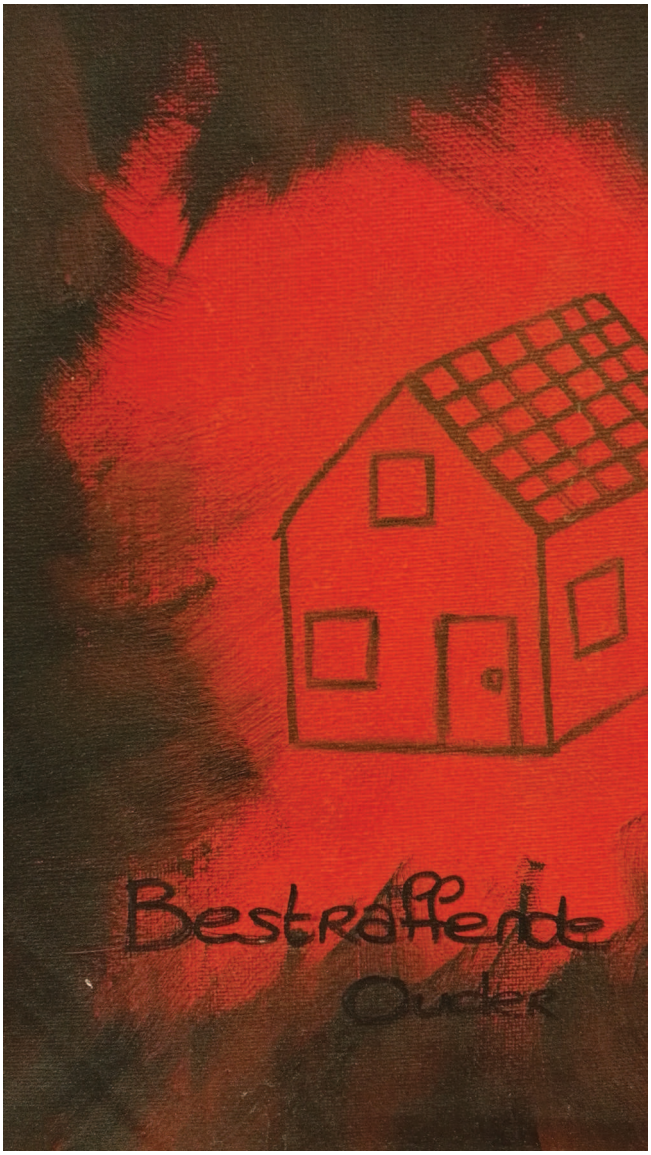
As already mentioned, the early-onset (EO) and adolescent-onset (AO) constructs can be operationalized in different ways, leading to outcomes that may vary depending on whichever operationalization is applied (Colins & Vermeiren, 2013). It is therefore unclear to what extent the results of the present study using the retrospective EO and AO distinction can be generalized to other (prospective) onset groups. Besides, it cannot be ruled out that some individuals in the AO group actually belonged to the EO group and vice versa (Cohn, Van Domburgh, Vermeiren, Geluk, & Doreleijers, 2012; Van Domburgh, Vermeiren, et al., 2009).

During the seventeen year period, due to experience and new insights, the approach to subjects that could potentially drop out may have evolved over time. Undoubtedly, there were changes in therapists, which obviously must have affected the treatment and hence the treatment outcome as well as the attrition. Nevertheless we believe that the results of our study are useful in clinical practice, not in the least because it was a naturalistic study.

Clinical implications

The findings of present study have implications for institutions specialized in treatment of youth with disruptive behavior. It was found that patients who completed treatment functioned better at follow-up and it thus seems important to prevent dropout. In order to realize this, patients with high chance at dropout should be identified so they can participate in an intervention to foster retention. For the purpose of identifying patients with high chance at dropout, the EO and AO distinction can be used, since it was found that early-onset disruptive behavior was associated with dropout. One way to reduce the chance at dropout is probably to invest substantially in the therapeutic alliance with the identified members of the early-onset group. It has to be noted that the distinction in age of onset seems of less importance for the further course of the treatment. Once the early-onset group stays in treatment, the treatment results appear to be as good as those of the adolescent-onset group, in the short term (De Boer et al., 2017) and at eighteen months follow-up.

Since cannabis usage prior to treatment was associated with dropout as well as with poor general daily functioning at follow-up, a treatment goal of adolescents treated for disruptive behavior should be reduction and prevention of drug use. This would hopefully lead to reduction of dropout and to improvement in general daily functioning at follow-up.



An assignment from the schema therapy: Imagine your critical side. At De Fjord we have chosen to use the term “side” instead of “mode”. This is understandable language for the youngsters and by using this term, it also implies that there is another side. The word takes away the blame, while it shows that it can still be prohibitive. Like in this case, the punitive parent. The maker of this artwork comes from a closed community where everyone keeps a close eye on each other. Because of this, the parents were very critical and punitive. In this artwork you experience the lack of a warm, stimulating parent, and the severe insecurity of home is depicted.