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BRIEF REPORT

Brief report: Follow-up outcomes of multisystemic therapy for adolescents with an intellectual disability and the relation with parental intellectual disability

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Abstract

Research on follow-up outcomes of systemic interventions for family members with an intellectual disability is scarce. In this study, short-term and long-term follow-up outcomes of multisystemic therapy for adolescents with antisocial or delinquent behaviour and an intellectual disability (MST-ID) are reported. In addition, the role of parental intellectual disability was examined.

Outcomes of 55 families who had received MST-ID were assessed at the end of treatment and at 6-month, 12-month and 18-month follow-up. Parental intellectual disability was used as a predictor of treatment outcomes. Missing data were handled using multiple imputation.

Rule-breaking behaviour of adolescents declined during treatment and stabilized until 18 months post-treatment. The presence or absence of parental intellectual disability did not predict treatment outcomes.

This study was the first to report long-term outcomes of MST-ID. The intervention achieved similar results in families with and without parents with an intellectual disability.

KEYWORDS

behavioural problems, delinquency, follow-up outcomes, intellectual disability, multisystemic therapy, predictor

1 | INTRODUCTION

Care re-entry, placement in residential youth care and incarceration are relatively common among adolescents with an intellectual disability¹ and comorbid severe behavioural problems (McReynolds, Schwalbe, & Wasserman, 2010; Thompson & Morris, 2016). To avoid

out-of-home placement, the home-based intervention multisystemic therapy (MST-ID) was tailored to the needs of adolescents with an intellectual disability and antisocial or delinquent behaviour. In a previous study by (Blankestein et al., 2019), all adolescents who had received MST-ID lived at home at 6-month follow-up and police contacts dropped from 51% at the start of treatment to 20% at

¹In the Netherlands, intellectual disability generally encompasses intelligence quotient (IQ) scores of 50 to 70 (mild intellectual disability) and IQ scores of 70 to 85 (borderline intellectual functioning in the Diagnostic Statistical Manual IV-TR, American Psychiatric Association, 2000) with co-occurring deficits in adaptive functioning. Symptoms must have begun during the developmental period (American Psychiatric Association, 2013).

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6-month follow-up. Until now, insight in long-term follow-up outcomes of systemic interventions for individuals with an intellectual disability is lacking.

As children with an intellectual disability often have problems retaining treatment results, research into the sustainability of achieved results is needed (Crnic, Neece, McIntyre, Blacher, & Baker, 2017). Therefore, the first aim of the current study was to assess whether treatment results of MST-ID were maintained up to 18-month follow-up. The second aim was to investigate whether outcomes of MST-ID varied as a function of parental intellectual disability, since parents with an intellectual disability often receive less social support and experience mental health problems, both of which have been shown to be related to child developmental outcomes (Llewellyn & Hindmarsh, 2015).

2 | METHOD

2.1 | Participants and Procedure

Between March 2014 and October 2015, 55 families were included in the study. All adolescents were aged 12 to 18, had an intellectual disability (intelligence quotient (IQ) score of 50–85) and showed antisocial or delinquent behaviour. Out of the 55 adolescents who took part in this study, 23% had an IQ score of between 50 and 69 and 77% had an IQ score of between 70 and 85. From each family, one parent was identified as the primary caregiver by the MST-ID therapist. Of the 55 parents, 32 (58%) had an intellectual disability (IQ score < 85). For a detailed description of inclusion criteria, consent procedure, and referral of participants to researchers, see Blankestein and colleagues (2019).

Therapists completed a questionnaire at the start and at the end of the treatment. Parents answered questionnaires during home visits by the research team at the start and at the end of the treatment and were contacted by an independent call centre for a telephone interview at 6-month, 12-month and 18-month follow-up. At 6-month follow-up, 40 parents (73% of the total sample) participated in the interview, at 12-month follow-up 33 parents participated (60%), and at 18-month follow-up 27 parents (49%) participated in the interview. Data from the start and end of treatment as well as 6-month follow-up have previously been discussed in an earlier study (Blankestein et al., 2019). All 12-month and 18-month follow-up data are thus newly collected data. Parents were contacted at each point in time, unless they withdrew their consent to partake in the study. The study was approved by the Internal Review Board of one of the participating mental healthcare agencies.

2.2 | MST-ID

MST is aimed at families with adolescents who display antisocial or delinquent behaviour and are at risk of out-of-home placement (Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009). Treatment sessions are conducted at home with a focus on

increasing parental skills and parental empowerment. MST-ID has been adapted to suit the needs of adolescents with an intellectual disability and their parents. Specific attention is paid to the generalization of new knowledge and skills and the promotion of the active involvement of the social network. The mean treatment duration seen in this study was 5.1 months (range 2 to 8 months).

2.3 | Measures

2.3.1 | Screening for intellectual disability

Parents were asked to complete the Dutch Screener for Intelligence and Learning Disabilities 18+ (SCIL 18+; Nijman, Kaal, Van Scheppingen, & Moonen, 2016). The screener provides a valid indication of whether a person's IQ is below 85 (Nijman et al., 2016).

For adolescents, unless IQ scores were already known, IQ was assessed using a short form of the Dutch Wechsler Intelligence Scale for Children (WISC-III-NL; Wechsler, 2005) in adolescents aged < 17 years. For adolescents aged 17–18 years, the Wechsler Adult Intelligence Scale–Short Form (WAIS-III-NL; Wechsler, 2000) was used.

2.3.2 | Behavioural problems: Rule-breaking behaviour

Parents reported on adolescent problem behaviour using the subscale “Rule-breaking behaviour” of the Child Behaviour Checklist (CBCL 6–18; Achenbach & Rescorla, 2001). T-scores were computed and used in analyses.

2.3.3 | Ultimate outcomes: Police contact, school or work, living at home

The three main outcomes of MST-ID were assessed at all time points: (a) the adolescent is living at home (yes/no), (b) the adolescent attends school or works for at least 20 hours a week (yes/no), and (c) the adolescent has not been involved with the police since the start of treatment (post-treatment)/in the previous six months (follow-up) (yes/no).

2.4 | Statistical analyses

2.4.1 | Missing data

Families without missing follow-up interviews ($n = 23$) were compared on baseline characteristics to families with at least one missing follow-up interview ($n = 32$). Independent t tests were calculated for continuous variables and chi-squares for categorical and dichotomous variables. Results revealed that families without missing follow-up interviews reported more parenting stress at

the start of treatment ($M = 70.26$, $SD = 8.15$) than families with one or more missing follow-up interview(s) ($M = 64.13$, $SD = 12.36$; $t(53) = 2.217$, $p = .031$). Families with and without follow-up data did not differ with regard to age, gender, IQ score, treatment duration, externalizing problem behaviour, rule-breaking behaviour, educational level, country of birth, living at home, engagement in school or work or police contact of the adolescent or SCIL score, parenting stress, educational level or country of birth of the parent.

Missing data were imputed 40 times using the predictive mean matching method (PMM) in SPSS version 25. PMM only imputes values that have been observed for that variable in other cases. As such, all imputed values are realistic values. All variables reported in this study were imputed. The analyses mentioned below were performed separately on the imputed data sets and on the original data set. Two-sided analyses were performed with a 95% confidence interval ($p = .05$).

2.4.2 | Analyses over time

Dependent (paired samples) t tests were used to assess whether continuous outcomes changed significantly over time. Treatment outcomes at the end and at follow-up were compared to these variables at the start of treatment. For dichotomous outcomes, analyses over time could not be conducted as pooled estimates could not be calculated (Li, Raghunathan, & Rubin, 1991). Nevertheless, descriptive results of dichotomous outcomes are reported.

2.4.3 | Parents with and without intellectual disability

(Logistic) Regression analyses were performed to explore if the presence of parental intellectual disability affected the treatment outcomes. Regression analyses were used to examine the relation between parental intellectual disability and continuous outcomes, and logistic regression analyses were used to examine the relation between parental intellectual disability for dichotomous outcomes. Analyses were conducted separately for adolescents who did and did not demonstrate certain outcome measures at start (e.g. police contact). Thus, logistic regression analyses for police contact were conducted separately for adolescents with and without police contact at the start of treatment. This was not the case for the variable "living at home" because all adolescents had to be living at home at the start of treatment to receive MST-ID.

3 | RESULTS

3.1 | Outcomes over time

The results of the imputed data (see Table 1) indicated that rule-breaking behaviour declined significantly between start and end

of treatment, between start and 12-month follow-up and between start and 18-month follow-up (small effect sizes (ES); Cohen's $d =$ between -0.29 and -0.44). Results did not differ between start and 6-month follow-up (small ES ; Cohen's $d = -0.21$).

The results of the original data showed a similar pattern, although the decline in rule-breaking behaviour between start and end of treatment, between start and 12-month follow-up and between start and 18-month follow-up showed larger effect sizes (medium ES ; Cohen's $d =$ between -0.50 and -0.68). Contrary to findings from the imputed data sets, rule-breaking behaviour declined significantly between start and 6-month follow-up ($p < .01$; medium ES ; Cohen's $d = -0.61$).

Descriptive percentages of the other treatment outcomes are depicted in Table 1. Results of the imputed data sets suggest that successes achieved at the end of treatment were not maintained up to 18-month follow-up. Results of the original data suggest that the outcomes "no police contacts of adolescents" and "adolescents living at home" were maintained until 12-month follow-up and 6-month follow-up, respectively.

3.2 | Parental intellectual disability

Analyses on the imputed and original data sets showed no significant differences in outcomes for parents with or without intellectual disability (see Table 2).

4 | DISCUSSION

The current study provides insight into long-term outcomes of MST-ID for families with adolescents with an intellectual disability and antisocial or delinquent behaviour, and parents with or without an intellectual disability. Families with and without missing data differed on levels of parenting stress at the start of treatment, but no other differences were found. Findings indicate that Rule-breaking behaviour declined during treatment and that this was sustained until 18 months after treatment. Although over 75% of adolescents had no police contact, were in school or work or lived at home at the end of the treatment, the percentages of adolescents without police contact, percentages of adolescents engaged in school or work, and percentages of adolescents living at home were lower at 18-month follow-up than at the end of treatment. This finding emerged in both the original and imputed data sets, suggesting that imputation of the missing data did not affect these results.

It may seem surprising that positive changes were found for rule-breaking behaviour, but not for other outcomes such as police contact. Previous studies comparing standard MST to other treatments also found a reduction in problem behaviour at the 18-month time-point, but not for recidivism or re-arrest (see e.g. Weiss et al., 2013). This finding may be explained by the way rule-breaking behaviour was measured in the present study. It includes different forms of rule-breaking behaviours such as having bad friends,

TABLE 1 Treatment outcomes MST-ID over time (N = 55)

Variable	Original data		Imputed data		Original data		Imputed data		
	Mean (SD)	Mean (SD)	n	t test	p-value	Cohen's d	n	t test	
Continuous variables									
Rule-breaking behaviour (CBCL)									
At the start of treatment	66.00 (8.19)	66.00 (8.16)	48	-4.720***	.000***	-0.68	55	-3.296**	.001**
At the end of treatment	62.46 (7.33)	62.65 (8.68)	38	-3.786*	.01*	-0.61	55	-1.549	.124
6-month follow-up	62.11 (8.77)	62.86 (14.54)	35	-0.422	.675	-0.07	55	0.100	.921
12-month follow-up	63.19 (8.19)	62.96 (6.82)	32	-3.039**	.005**	-0.54	55	-2.442*	.015*
18-month follow-up	63.76 (8.87)	63.22 (6.53)	27	-0.062	.951	-0.01	55	0.049	.961
			25	-2.491*	.020*	-0.50	55	-2.119*	.034*
			24	0.273	.787	0.06	55	0.282	.778
Categorical variables									
% (n)									
No police contacts									
At the start of treatment			49.1 (55)						49.1 (55)
At the end of treatment			78.2 (55)						78.2 (55)
6-month follow-up			81.1 (37)						70.9 (55)
12-month follow-up			81.3 (32)						71.3 (55)
18-month follow-up			76.0 (25)						66.7 (55)
Adolescent is engaged in school or work									
At the start of treatment			70.4 (54)						70.0 (55)
At the end of treatment			85.5 (55)						85.5 (55)
6-month follow-up			73.7 (38)						68.0 (55)
12-month follow-up			65.6 (32)						63.5 (55)
18-month follow-up			64.0 (25)						60.0 (55)
Adolescent lives at home									
At the end of treatment			96.4 (55)						96.4 (55)
6-month follow-up			100.0 (38)						86.0 (55)
12-month follow-up			90.6 (32)						80.7 (55)
18-month follow-up			96.0 (25)						77.1 (55)

*p < .05.

**p < .01.

***p < .001.

TABLE 2 Treatment outcomes in subgroups of parents with ($n = 32$) and parents without an intellectual disability ($n = 23$)

Variable	Original data				Imputed data			
	<i>b</i>	<i>SE</i>	<i>t test</i>	<i>p-value</i>	<i>b</i>	<i>SE</i>	<i>t test</i>	<i>p-value</i>
Continuous variables								
Rule-breaking behaviour (CBCL)								
At the end of treatment	-1.15	1.69	-0.685	.497	-0.12	2.13	-0.055	.956
6-month follow-up	0.56	2.69	0.208	.837	0.30	3.85	0.078	.938
12-month follow-up	0.14	3.25	0.042	.967	-0.77	2.02	-0.379	.705
18-month follow-up	-1.15	4.57	-0.251	.804	-1.26	2.03	-0.624	.533
Categorical variables								
Police contacts during MST								
Present	At the end of treatment	-0.88	0.97		.365	-0.88	0.97	.365
Absent		0.00	0.98		1.000	0.00	0.98	1.000
Present	6-month follow-up	-0.41	0.97		.677	-0.48	0.96	.621
Absent		19.41	13,397.66 ^b		.999	1.55	2,594.45 ^a	1.000
Present	12-month follow-up	-1.32	1.09		.224	-0.96	1.01	.340
Absent		19.59	15,191.52 ^b		.999	0.38	1.38	.780
Present	18-month follow-up	-1.95	1.28		.129	-0.83	0.91	.360
Absent		20.10	17,974.84 ^b		.999	0.36	1.28	.779
Engagement in school or work								
Present	At the end of treatment	0.17	1.27		.896	-0.21	1.21	.860
Absent		1.44	1.30		.268	1.12	1.26	.371
Present	6-month follow-up	-0.29	0.93		.757	-0.07	0.89	.940
Absent		0.22	1.48		.880	0.19	1.31	.888
Present	12-month follow-up	-0.76	0.89		.390	-0.73	0.81	.369
Absent		1.39	1.80		.442	0.10	1.37	.941
Present	18-month follow-up	1.07	1.01		.287	0.50	0.89	.575
Absent		0.69	1.87		.711	0.25	1.23	.839
Living situation adolescent								
At home	At the end of treatment	-0.34	1.44		.812	-0.34	1.44	.812
At home	6-month follow-up	n/a	-		n/a	3.33	2,963.07 ^a	.999
At home	12-month follow-up	0.76	1.28		.552	0.37	0.99	.709
At home	18-month follow-up	18.72	11,602.71 ^a		.999	-0.02	0.82	.978

^aThis high value is a result of zero-observations in the cells 'adolescent with police contact' (in 3 of the 40 datasets) and 'adolescent does not live at home' (in 5 of the 40 datasets).

^bThese high values are a result of zero-observations in the cells 'adolescent with police contact' × 'caregiver with disability'.

^cThis value could not be calculated since all adolescents were living at home at 6-month follow-up.

^dThese high values are a result of zero-observations in the cells 'adolescent not living at home' × 'caregiver without disability'.

swearing, stealing or vandalism. While these behaviours declined over time, MST-ID may have been less able to modify more serious antisocial behaviours leading to police contact.

For persons with an intellectual disability, the retention of treatment results is often difficult (De Wit, Moonen, & Douma, 2012). While a meta-analysis showed that several systemic interventions targeting antisocial behaviour produce positive long-term effects, it did not distinguish between adolescents with and without an intellectual disability (Sawyer, Borduin, & Dopp, 2015). It is, therefore, still unclear what the long-term follow-up results are of systemic interventions for adolescents with

antisocial or delinquent behaviour and an intellectual disability (Crnic et al., 2017; Sawyer et al., 2015). As the current study did evaluate outcomes up until 18-month follow-up, it adds to a small body of research and may serve as a point of reference for future studies.

Parental intellectual disability did not influence adolescents' treatment outcomes. This could indicate that MST-ID achieves similar results for families with parents with as well as without an intellectual disability. Further research is needed to establish if these findings can be replicated, especially since the current analyses pertain to a relatively small sample of 55 families.

5 | LIMITATIONS

A first limitation is that the study did not employ a control group, and thus outcomes cannot be ascribed to the treatment condition. Future research, therefore, should include a control group, for instance families with adolescents with an intellectual disability and antisocial or delinquent behaviour receiving a different type of treatment.

A second limitation is the amount of missing data seen in the original data set. To deal with missing data, the current study employed multiple imputation. In general, the results from the imputed data showed smaller effect sizes and outcomes were less positive than results in the original data. It is hypothesized that parents experiencing more difficulties might drop-out at follow-up more often. Therefore, it might not be surprising that the imputed data had less favourable outcomes than the original data. Since imputation allows for the discussion of long-term outcomes of all 55 families in this study, it is believed the imputed data are of substantial added value to this study.

A third limitation is that the authors did not know if all parents of the adolescents had an intellectual disability, since only one parent per family was involved in the research. Subsequently, families may have been categorized as not having a parent with an intellectual disability although the parent's partner *did* have an intellectual disability. To develop a more comprehensive understanding of the family situation, future research may need to assess parental intellectual disability of *all* caregivers involved.

A fourth limitation is that participants with mild intellectual disability (IQ score 50–69) or borderline intellectual functioning (IQ score 70–85) were brought together in one target group. In the Netherlands, individuals with mild intellectual disability or borderline intellectual functioning may be admitted to the same (healthcare) organizations for treatment and care (Seelen-de Lang et al., 2019). Henceforth, the present authors defined intellectual disability as an IQ score of between 50 and 85. As this definition may differ across international studies, it affects the generalizability of results.

6 | CONCLUSION


The current study is one of few—insofar the present authors are aware—studies looking into the follow-up outcomes of an intervention for adolescents with an intellectual disability and antisocial or delinquent behaviour and parents with or without an intellectual disability. As generalization and the sustainability of treatment results is difficult for these families, it is imperative that intervention studies employ follow-up data more often.

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