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Hoogsteder, L.M.; Schippers, E.E.; Sweers, N.; Stams, G.J.J.M.

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PAPER

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A quasi-experimental pilot study to the effects of Responsive Aggression Regulation Therapy (Re-ART) Outpatient for young adults

Larissa M. Hoogsteder PhD[1] | Eveline E. Schippers MSc[1] | Nienke Sweers MSc[1] | Geert Jan J.M. Stams PhD[2]

[1]Forensic Care Specialists, Forensic outpatient treatment center de Waag, Utrecht, The Netherlands

[2]Program Group: Forensic Child and Youth Care, University of Amsterdam, Amsterdam, The Netherlands

Correspondence
Larissa M. Hoogsteder, Forensic Care Specialists, Forensic outpatient treatment center de Waag, Utrecht, The Netherlands.
Email: lhoogsteder@dewaagnederland.nl

Abstract

It is important to provide treatment for juvenile and young adult violent offenders, since no or (too) late treatment increases the risk of recidivism and persistent aggressive behavior in adulthood. In this study, we investigated the efficacy of the intervention Responsive Aggression Regulation Therapy (Re-ART) Outpatient, which has been developed for adolescents and young adults between 16 and 24 years old with severe aggression problems. This quasi-experimental (pilot) study compared the effects of Re-ART Outpatient (n = 47) with a control group (n = 29) receiving treatment as usual on measures regarding risk of violent recidivism, impulsivity, emotional/personal functioning, family functioning, motivation, handling anger, self-reported problem behavior, coping skills, and cognitive distortions. Re-ART showed significantly better results than the control group on risk of violent recidivism, impulsivity, emotional/personal functioning, motivation, handling anger, certain coping skills, and certain cognitive distortions. Family functioning and self-reported rule-breaking behavior did not differ significantly between the groups. The results implicate that Re-ART is a promising outpatient intervention for young adults with severe aggressive behavior. The results can be explained by the fact that Re-ART treats both systemically and individually and pays specific attention to stress reduction and the improvement of executive functions.

KEYWORDS
aggression, control group, forensic outpatient treatment, forensic psychiatry, impulsivity, risk of violent recidivism, systemic, young adults

1 | INTRODUCTION

Even though the international number of crimes committed by juvenile or young adult offenders is still decreasing [1–3], violent behaviors, such as threats, violent abuse, (attempted) manslaughter, vandalism, and public order disturbances, remain a big problem because of its severe consequences for victims and high societal impact. When considering the impact of violent offenses, one should not only take into account the material and physical damages, litigation costs, and costs related to implementation and execution of convictions, but also the public impact given that aggressive acts can lead to trauma-related symptoms, anxiety, and avoidance behavior in victims [4–6].

It is important to provide treatment for juvenile and young adult violent offenders, since no or (too) late treatment increases the risk

of recidivism and persistent aggressive behavior in adulthood [7–9]. To reduce criminality and the mental health-related costs and consequences for victims, we need evidence-based interventions and prevention programs for adolescents and young adults with aggression problems [5]. In this study, we investigate the efficacy of the intervention Responsive Aggression Regulation Therapy (Re-ART) Outpatient.

Re-ART Outpatient has been developed for adolescents and young adults between 16 and 24 years old with feelings of anger that lead to (severe) aggression problems. Re-ART Outpatient is an adaptation from Re-ART Residential, which was designed for young adults aged 16-24 that receive mandatory residential forensic treatment in the Dutch judicial system [10,11]. The target group of 16- to 24-year-olds differs from youth and adult samples. Executive functioning is not yet fully matured such that impulse control problems are more prevalent in this group [12,13], yet they have different life circumstances than children under 16 with for, instance jobs, financial responsibilities, partners, or children of themselves. The target group for Re-ART Outpatient 16-24 years often shows cluster-B personality disorders and oppositional defiant disorder or conduct disorder, regularly combined with ADHD and substance abuse [14,15]. A large part of Re-ART's target group has experienced social exclusion or discrimination, which increases feelings of anger [16–18] and therefore aggressive behavior [19].

Re-ART integrates several theoretical foundations to explain the development of aggressive behavior and combines this with elements that have shown to effectively decrease recidivism in adolescents and young adults with aggression problems. First of all, Re-ART applies the biopsychosocial model, which assumes that biological, psychological, and social vulnerabilities factors interact in causing aggressive behavior [20]. Re-ART therefore provides tools to deal with biological vulnerabilities, applies psychological interventions, tries to reduce environmental risk factors, and aims to strengthen social support, as explained further below.

Re-ART uses the cognitive behavioral therapeutic (CBT) model to explain aggressive behavior with regard to cognitive and emotional processes [21]. CBT is considered the most effective therapy format available for forensic clients [17,22,23]. This model is based on social and cognitive learning theory, in which dysfunctional schemata of social information play an important role. Dysfunctional schemata are persistent beliefs and expectations formed in childhood, which determine emotional and behavioral responses later in life. Re-ART incorporates the recognition of cognitive distortions (irrational or inaccurate thoughts or beliefs), the use of helping thoughts [23,24], and insight in consequences and rewards of behavior [25]. Also, problem-solving skills and drama therapeutic techniques are practiced, such as role-play and experiential exercises [25–27].

Also, the development and continuation of aggressive behavior is connected to problems with executive functioning, that is, working memory, cognitive flexibility, and inhibition, which relates to biological, psychological, and social factors [28]. The extent to which someone is able to control their impulses (behavioral inhibition) is found to be the strongest predictor of aggression [29]. Adolescence is known to be a particularly vulnerable time window where risk-taking tendencies peak and behavioral control is not yet fully developed [12,30].

Highlights

- Re-ART Outpatient is a promising intervention for young adults with aggressive behavior.
- Aggressive young adults seem to profit from an approach that is both individual and systemic.
- Stress and executive functioning seem relevant focus points in the treatment of aggression.

Furthermore, (chronic) stress plays an important role, because stress increases impulsive behavior and problematic emotion regulation, which may result in aggression [31,32]. Stress sets the brain into survival modus (fight or flight), which might encourage aggressive behavior [33,34]. Re-ART incorporates stress reduction techniques where relaxation exercises are applied [25]. Finally, Re-ART applies the Risk, Need, Responsivity principles (RNR) for effective treatment [26]. The Risk principle requires that the intensity of treatment (frequency and duration) is adjusted to one's risk of recidivism, with higher risk indicating more intensive treatment. The Need principle indicates that treatment focus should be adjusted to the dynamic criminogenic risk factors of the individual. The Responsivity principle dictates that treatment should incorporate techniques that have proven to be successful in the target group, and that treatment should be adjusted to the individual's learning style, level of motivation, and specific capacities and limitations. Research shows that treatment is most effective when adopting these principles and that not adopting RNR principles might even be counter-effective [26,35].

To increase responsivity to treatment, Re-ART tries to positively counteract possible impediments, such as lack of motivation, distrust and attention deficits by focusing on the advantages of behavioral change, augmenting problem awareness by administering psycho-education, aligning to the client's important life domains, and the use of motivational interviewing. Also, Re-ART focuses on stress reduction to enable receptivity for behavioral change and help decrease aggression problems [17,27,36]. Re-ART uses mindfulness exercises focused on awareness, relaxation, and focusing attention [37–39]. Another precondition for responsivity is the establishment of a therapeutic relationship [40–42]. This includes therapist skills such as validation and empathizing with the client, which helps decrease feelings of anger and distrust, establishes a connection between therapist and client, and increases responsivity to treatment [43–45]. Also, Re-ART Outpatient consists mainly of individualized treatment, since research shows that group treatment is less effective in antisocial samples [46–48]. Some of Re-ART's elements are comparable to Dialectical Behavior Therapy (DBT), where validation, mindfulness and stress reduction, emotion regulation, and behavioral skills training are core elements [44]. However, Re-ART adds

focus to impulsivity, persistent feelings of revenge and anger, and cognitive distortions related to aggressive behavior, and uses drama therapeutic and experiential exercises. DBT has shown efficacy mainly in patients with borderline personality disorder, depression, or suicidal thoughts [49,50], but there are no clear finings yet regarding aggressive or antisocial behavior [50-52].

Previous research in a clinical setting showed that Re-ART Residential significantly reduced aggressive behavior, improved coping skills, improved responsivity to treatment, and decreased cognitive distortions (with exception of negative attitudes) with a medium to large effect size, compared with a control group receiving treatment as usual [11]. Another study showed that Re-ART Residential reduced recidivism as well, with the Re-ART group showing 29.8% less violent recidivism and 37.7% less general recidivism than the control group after 3 years [53]. As of yet, the outpatient version of Re-ART has only been researched in pilot studies, where Re-ART significantly effectuated positive changes in risk of violent recidivism, aggression, coping skills, cognitive distortions, and family functioning [54], and executive functioning [55].

This study investigates Re-ART's effects on risk of violent recidivism, impulsivity, emotional and personal functioning, aggression and rule-breaking behavior, motivation, active coping, cognitive distortions, and family functioning compared with a control group that complied with Re-ART's indication criteria, but received treatment as usual (TAU). We hypothesize that, in comparison with the control group, Re-ART more effectively decreases the risk of violent recidivism, impulsivity, aggression and rule-breaking behavior, and cognitive distortions, and improves active coping, emotional and personal functioning, motivation, and family functioning.

2 | METHODS

2.1 | Sample

This quasi-experimental study was conducted at five locations of an outpatient treatment center for forensic psychiatry in the Netherlands. The total sample (N = 76) was a convenience sample consisting of a Re-ART group (n = 47) and a control group receiving TAU (n = 29). The adolescents in both groups were to comply with Re-ART's indication criteria; that is, all clients showed medium to high risk of violent recidivism; had a diagnosis of oppositional defiant disorder, conduct disorder, conduct disorder not otherwise specified, or antisocial personality disorder; and directed their anger to other people or things verbally or physically at least once a week. Clients were included in the Re-ART group when their therapist had at least one year of experience with giving the intervention and when the therapy sessions had sufficient program integrity (see below). Clients were included in the control group when they were on a waiting list for Re-ART or because they were referred to other treatment modalities, such as parent groups or outreaching systemic therapy (MST and PLL). Only clients who gave informed consent for participation were included.

In the total sample, approximately one-third of the clients reported a migration background (32% in the Re-ART group, 38% in the control group). In the total group, 62% had Dutch nationality, 12% Dutch–Moroccan, 9% Dutch–Surinam, 4% Dutch–Antilles, 3% Dutch–Turkish, 3% had another western ethnicity, and 7% another nonwestern ethnicity. The chi-square tests and t-tests compared the experimental and control group on various background variables, such as age, gender, intelligence, ethnic background, or diagnosis (see Table 1). The experimental and control group did not statistically differ on various background variables.

The control group received TAU, which in the current institution consisted of a broad offer of various interventions: 45% received CBT [56], 28% received Parenting with Love and Limits (PLL) [57], 21% received Multi-Systemic Therapy (MST) [58], and 7% others received a nondescript mixture of individualized treatment. In both the Re-ART group and control group, additional treatment modules focusing on substance misuse were offered when necessary.

2.2 | Description of Re-ART

Re-ART offers tailor-made treatment with a modular approach, consisting of standard and optional modules. Standard modules include the following: Intake and Motivation (start module), Controlling Skills, Influence of Thinking, and Assertiveness. Optional modules are provided if relevant to the client's problems, and include the following: Stress Reduction, Impulse Control, Observation and Interpretation, Emotion Regulation, Handling Conflicts, and a module for the family/system. The focus is on individual treatment, with involvement of the system where possible. System members are taught skills to support the client and are involved in the execution of the signaling plan, homework assignments, and evaluation of progress. Individual treatment sessions have a frequency of at least once a week with a minimum duration of one hour. When the risk of recidivism is high, this can be increased to three times a week, according to the Risk principle [21].

2.3 | Description of TAU

MST has shown to effectively improve parenting skills, which positively affected aggression problems, and to effectively decrease the number of out-of-home placements for adolescents [59,60]. MST consists of five months of intensive, outreaching treatment at clients/family home, and includes the availability of a therapist at any time of the day. PLL has shown to lead to reduced risk of violent recidivism and domestic violence and reduced deviant/oppositional behavior and improved parenting skills, as reported by the parents [61,62]. PLL is an intensive, relatively short treatment program for families with children aged 12-18 with moderate to severe externalizing behavioral problems and (potential) delinquent behavior, consisting of six group sessions and several individual parallel sessions. By indication, the family relationships are disrupted and there is a

TABLE 1 Characteristics Re-ART Group (n = 47) and TAU Control Group (n = 29)

	Re-ART	TAU		
	M (SD)	M (SD)	*t* (df=74)	*P*
Age (at start intervention)	18.8 (2.2)	18.4 (2.5)	0.83	0.411
IQ score	88.9 (10.0)	90.7 (11.6)	−0.72	0.474
Risk Violent Recidivism (T0)[A]	4.0 (.69)	3.9 (.70)	0.42	0.676
Motivation (T0)[A]	2.3 (1.17)	2.5 (1.24)	−0.73	0.469
	% (n)	*% (n)*	*X (df =1)*	
Gender (male)	78.7 (37)	82.8 (24)	0.18	0.668
Migration Background	31.9 (15)	37.9 (11)	0.29	0.591
Diagnostic Features				
Substance Abuse	48.9 (23)	37.9 (11)	0.88	0.349
Conduct Disorder NOS	27.7 (13)	41.4 (12)	1.53	0.216
Conduct Disorder	27.7 (13)	27.6 (8)	0.01	0.994
Mild Intellectual Disabilities	27.7 (13)	20.7 (6)	0.47	0.495
Oppositional Defiant Disorder	17.0 (8)	17.2 (5)	0.01	0.980
ADHD	12.8 (6)	17.2 (5)	0.29	0.590
Posttraumatic Stress Disorder	8.5 (4)	10.3 (3)	0.07	0.788
Problem Behavior				
Violence	89.4 (42)	82.8 (24)	0.68	0.408
Domestic Violence	38.3 (18)	24.1 (7)	1.63	0.202
Property Crimes	34.0 (16)	17.2 (5)	2.53	0.112
Property +Violence	19.1 (9)	6.9 (2)	2.18	0.140
Sexual Misconduct	2.1 (1)	3.4 (1)	0.12	0.727
Treatment	M (SD)	M (SD)	*t* (*df*=74)	
Duration (weeks)	48.3 (18.2)	42.00 (17.7)	1.50	0.138
Frequency of Contact (hours/week)	1.2 (.72)	1.64 (1.3)	−1.79	0.081

NB.[A] lower scores indicate better results. Diagnostic features are based on clinical judgment. Problem behavior is based on arrests or problem behavior as reason for referral to the institution.

(severe) lack in parenting skills. With regard to CBT, research shows that offenders completing CBT-based programs show lower rates of reoffending [12,63].

These interventions overlap with Re-ART, because of their shared CBT approach. However, MST and PLL are aimed at broader problem behavior and mainly focus on improvements in the client's system, such as parenting skills. CBT focuses less on a systemic approach, but merely on improving current symptoms, problem behaviors, and personality disorder-related problems. Re-ART combines these by focusing on individual risk factors, responsivity issues, integrated with a systemic approach.

2.4 | Procedure

The study was conducted in accordance with the Netherlands Code of Conduct for Research Integrity [64] and the research policies for patient research of the involved institution. Data collection occurred between 2012 and 2016. Clients were included for the study if they complied with Re-ART's indication criteria and signed the informed consent form for participation in scientific research (40 clients did not give their consent). A pretreatment assessment (T0) was administered within four weeks after the intake session, and a post-treatment assessment (T1) was administered after completing the intervention. Data for the control group were collected at two of the treatment facility's locations where Re-ART was no yet fully implemented and at one location where a study to PLL was conducted. Dropout, for example because of demotivation, clinical placement because of crises, severe distrust, or incomplete data, was equal for both groups (Re-ART 34%, n = 16; TAU 34,5%, n = 10).

2.5 | Program integrity

The level of program integrity can affect treatment results [54,65-68]. Program integrity indicates whether treatment is delivered according

to treatment manuals, by sufficiently trained therapists, and in a monitored fashion [69]. In other words, program integrity symbolizes the degree to which therapists adhere to a specific intervention. A sufficient degree of program integrity is a necessary precondition to draw valid conclusions about whether or not a program is successful in changing behavior. Therefore, at both T0 and T1 the level of program integrity for Re-ART was assessed with a client self-report and therapist-report session checklist and evaluation form. These forms checked whether therapists complied with basic prerequisites to provide treatment, such as requirements regarding education, peer-to-peer consultation, and minimal caseload. Also, it assessed to what extent Re-ART's effective elements were offered during treatment, such as whether intensity and duration of treatment were adjusted to the risk level, whether the offered modules matched individual risk factors, and whether enough attention was paid to learning style (Risk, Need, and Responsivity principles). The Re-ART group only included cases where the degree of program integrity was scored for at least 70% [70].

MST and PLL have set high standards for program integrity and have an intrinsic system with supervisors to monitor this. CBT also works with a protocoled approach in which the program integrity is tested during supervision, but rather on-demand than in a structural manner.

2.6 | Instruments

2.6.1 | Risk of violent recidivism and criminogenic risk factors

The Risk Assessment Instrument for Forensic Mental Health (RAF MH) is a structured clinical risk assessment instrument to identify risk domains and assess recidivism risk of offenders in forensic outpatient treatment [71,72]. It consists of a youth and adult version. The RAF MH was used to collect information on the offenders' criminogenic characteristics. It combines several actuarial and structured professional judgment instruments, supplemented with factors relevant for an outpatient treatment population. Both versions of the RAF MH consist of 12 domains: Previous and current offenses (8 items), School/Job (9 items), Finances (3 items), Living environment (3 items), Family (12 items), Social network (5 items), Leisure time (3 items), Substance (7 items), Emotional/Personal (16 items), Attitude (5 items), Motivation for treatment (8 items), and Sexual problems (15 items).

Items are scored by trained therapists according to five categories (low, 1; low–moderate, 2; moderate, 3; moderate–high, 4; and high, 5). Higher scores indicate more problematic behavior. For this study, the violent risk score was used as an indication of the risk level for reoffending with a violent offense. The items Impulsivity, Family functioning, Motivation, Attitude, and Emotional/Personal were also used separately to measure these specific risk factors, as well as the subitem, Handling Feelings of Anger. Results show reliable agreement between evaluators and good predictive validity of general and violent recidivism within one year after treatment [73].

2.6.2 | Youth self-report

The Youth Self-Report (YSR) was used to assess client-reported problem behaviors and symptoms [74]. The YSR has an 8-factor structure, which has been replicated with a good fit in 23 societies including the Netherlands [75]: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior. Items are scored on a 3-point scale ranging from 0 (*not true or not at all*) to 2 (*very true or often*). The current study only uses the scales Rule-Breaking Behavior (T1: $\alpha = 0.83$, T2: $\alpha = 0.81$) and Aggression (T1: $\alpha = 0.86$, T2: $\alpha = 0.82$). Sample questions are as follows: "I set fires" (Rule-Breaking) and "I get in many fights" (Aggression).

2.6.3 | Cognitive distortions

The Brief Irrational Thoughts Inventory (BITI) is a self-report questionnaire that consists of 18 statements describing different kinds of irrational (dysfunctional) thoughts or cognitive distortions [76]. The BITI is subdivided into three subscales. Each item of the BITI is rated on a 6-point Likert-type scale ranging from 1 (*I totally disagree*) to 6 (*I totally agree*; low score is positive). A study showed favorable psychometric properties of the BITI: Convergent, divergent, and concurrent validity were established, while measurement invariance was indicated across gender and different ethnic origin groups (native vs. non-native Dutch respondents) by means of confirmatory factor analysis, supporting construct validity of the BITI [76]. In the current pilot study, reliability was established for Aggression and Justification (9 items: e.g., "I have the right to retaliate if someone harms me." T1: $\alpha = 0.80$, T2: $\alpha = 0.87$), Subassertiveness (5 items: e.g., "I think it's really bad if someone is angry with me." T1: $\alpha = 0.86$, T2: $\alpha = 0.82$), and Distrust (4 items: e.g., "There are a lot of people who don't like me." T1: $\alpha = 0.86$, T2: $\alpha = 0.82$).

2.6.4 | Active coping

The Utrecht Coping List (UCL) is a 47-item Dutch self-report questionnaire that assesses coping behaviors using seven scales, namely Active Handling, Palliative Coping, Avoidance, Social Support, Passive Coping, Expression of Emotions, and Reassuring Thoughts [77]. Each item is rated on a 4-point Likert scale ranging from 1 (never) to 4 (very often). The UCL has sufficient reliability [65], construct validity, and predictive validity [78]. Only one of these styles was used in the present pilot study: Problem-Focused (active) Coping (7 items, maximum score =28; T1: $\alpha = 0.69$, T2: $\alpha = 0.71$).

2.7 | Statistical analyses

Analyses of covariance (ANCOVA) were conducted to test for differences in posttreatment scores between the groups, controlling for

TABLE 2 Differences between Re-ART and TAU Control Group on experimental variables

	Re-ART (n = 47)						TAU (n = 29)							
	T1		T2				T1		T2				(1, 75)	
	M	SD	M	M[a]	SD	d	M	SD	M	M[a]	SD	d	F	d[a]
Risk Violent Recidivism (RAF)	4.00	0.69	2.28	2.27	0.80	2.30**	3.93	0.70	3.38	3.40	0.90	0.68*	37.01**	1.34
Impulsivity (RAF)	1.34	0.70	0.96	0.99	0.62	0.57*	1,52	0.63	1.38	1.33	0.67	0.22	6.30*	0.53
Emotional/Personal (RAF)	3.85	0.55	2.40	2.41	0.88	1,98**	3.86	0.69	3.34	3.34	0.94	0.63*	23.37**	1.03
Family Functioning (RAF)	3.19	1.19	2.11	2.11	0.89	1.03**	3.24	0.95	2.28	2.27	1.07	0.94**	0.52	0.16
Motivation (RAF)	2.28	1.17	1.51	1.53	0.90	0.74**	2.48	1.24	2.62	2.59	1.29	−0.11	18,53**	0.99
Handling Anger (RAF)	1.89	0.31	1.06	1.05	0.39	2.35**	1.72	0.46	1.45	1.47	0.51	0.56*	15.83**	0.95
Coping Skills (RAF)	1.43	0.54	0.83	0.83	0.56	1.09**	1.45	0.51	1.24	1.24	0.51	0.41*	10.99*	0.75
Aggression (YSR)	8.87	5.47	5.60	5.36	4.64	0.64**	7.55	6.22	7.21	7.58	5.07	0.06	5.37*	0.46
Rule-Breaking Behavior (YSR)	7.40	4.47	5.96	5.91	4.35	0.33*	7.21	5.93	6.28	6.35	5.12	0.17	2.44	0.09
Active Coping (UCL)	15.85	2.95	18.68	18.74	2.52	1.03**	16.21	3.61	17.07	16.97	3.62	0.24	8.17*	0.59
Aggression and Justification (BITI)	25.79	7.42	21.53	21.46	6.52	0.60**	25.45	8.91	25.14	25.25	7.90	0.04	8.21*	0.54
Subassertiveness (BITI)	12.96	5.80	11.17	11.19	3.64	0.37*	13.10	5.63	14.93	14.89	4.23	−0.36*	26,69**	0.96
Distrust (BITI)	9.31	3.74	7.91	7.89	2.81	0.42*	9.21	3.11	10.21	10.24	4.07	−0.27	13.77**	0.70

NB. RAF lower scores indicate better functioning.

[a]means adjusted.

*P < 0.05.

**P = 0.00.

pretreatment scores by using these as a covariate in the ANCOVA [79]. Since no significant differences were found in background variables, it is not necessary to control for other items. Effect sizes were computed in terms of Cohen's *d*, based on posttreatment means and standard deviations of the Re-ART and control group, corrected for pretreatment means and standard deviations of these groups. Cohen (1992) categorized these as follows: 0.19 < *d* < 0.49 = small effect, 0.50 < *d* < 0.79 = medium effect, *d* > 0.80 = large effect [80]. All statistical analyses were performed using *IBM SPSS Statistics 25*.

3 | RESULTS

The ANCOVA showed that the experimental group had a significantly lower posttreatment risk of violent recidivism than the control group as measured with the RAF, a large effect (see Table 2). Also, the Re-ART group showed higher posttreatment motivation, better emotional/personal functioning, better handling anger (all large effects), better coping skills, and less impulsivity (both medium effects) than the control group on the RAF. There were no significant differences on family functioning (including parenting skills). Furthermore, the experimental group showed significantly less self-reported aggression on the YSR posttreatment than the control group, a small effect. However, no significant differences were found regarding self-reported rule-breaking (YSR). The experimental group did significantly differ from the control group on active coping (UCL) with a medium effect. On the BITI, the experimental group reported significantly less posttreatment cognitive distortions related to subassertiveness than the control group (large effect); significantly less cognitive distortions related to distrust (medium effect), and significantly less cognitive distortions related to aggression (medium effect).

4 | DISCUSSION

This study compared the effects of Re-ART Outpatient (*n* = 47), a treatment intervention for severely aggressive adolescents and young adults between 16 and 24 years old, with a control group receiving treatment as usual (TAU) (*n* = 29). The results showed that the Re-ART group had more positive changes in risk of violent recidivism, impulsivity, handling anger, self-reported aggression, motivation, coping, cognitive distortions, and emotional/personal functioning in comparison with the control group. The effect sizes were generally medium–large, except for self-reported aggression, which showed a small effect size. There were no significant differences between the groups on family functioning (among which parenting skills) and on rule-breaking behavior. The control group showed no significant changes from pretreatment to posttreatment on impulsivity, motivation, and cognitive distortions, aggression, rule-breaking behavior, and active coping.

The lack of difference between the groups on family functioning might be explained by the treatment modalities of the control group, of which 48.3% (*n* = 14) received MST or PLL. These interventions both have a systemic approach and focus on improving family functioning by means of improving parenting skills, decreasing the number of conflicts in the family, and improving the quality of contact between parent and child. The current results showed similar positive changes in both groups from pretreatment to posttreatment (large effect) on family function, which indicates that Re-ART's family module is an adequate intervention to addresses family functioning.

According to our expectations, the Re-ART group showed less cognitive distortions related to subassertiveness, distrust, and aggression compared with the control group. The control group even showed increased cognitions related to subassertiveness. MST and PLL do not directly focus on reducing cognitive distortions. A focus on problem behavior during treatment, aimed at creating problem awareness, could lead to feelings of stigma, shame, and guilt [81,82], which in turn may strengthen cognitive distortions related to subassertiveness, such as low esteem and feeling worthless. Furthermore, an approach, in which the therapist collaborates with the caregivers, may reinforce distrust in youngsters, especially when there is not sufficient individual attention for the youngster.

In the control group, the results regarding motivation for treatment were negligible, whereas Re-ART showed substantial improvements. MST and PLL mainly focus on motivating parents, in the belief that when parents approach their child differently, this leads to behavioral change in the child. As we know that motivation is an important part of responsivity for treatment and thus behavioral change [26], we recommend that the youngster's motivation should be incorporated in forensic treatment.

This study shows that Re-ART and the control group were equally ineffective in reducing rule-breaking behavior. Perhaps, questions about rule-breaking behavior are especially sensitive to socially desirable responses by adolescents and young adults at the beginning of treatment, and/or both groups created greater insight into their own problem behavior during treatment [83,84].

The results indicate that Re-ART pays more attention than the control group to various criminogenic risk factors related to the development and maintenance of aggressive behavior. This is likely to result in larger reductions of risk of violent recidivism. These effects may be accounted for by the fact that Re-ART incorporates both systemic treatment and an individual approach, as opposed to MST/PLL's systemic treatment and CBT's individualized treatment. This is in concordance with meta-analytic results showing that a combined individual and systemic approach is effective in reducing aggression [85]. The results can also be explained by the fact that Re-ART pays specific attention to stress reduction and improving executive functions. We suggest that it is important that therapists who treat forensic juveniles acquire sufficient expertise on topics of systemic treatment, stress reduction, and executive functions in youth.

Some methodological limitations exist in relation to the current procedures. First, we used a quasi-experimental design, while it is known that randomized trials are the most appropriate to study interventions. Randomized group assignment was, however, impossible given organizational restraints. This could favor the results regarding Re-ART since clients included in the Re-ART group could

have been better fitted for that intervention. Second, the control group received TAU, which consisted of various interventions that have different focus points. PLL and MST target families rather than individuals, whereas CBT focuses on individual thinking patterns and behaviors. Re-ART incorporates these elements, but is never fully individual, fully systemic, nor fully cognitive. It must be taken into consideration that participants were allocated to specific intervention types for certain reasons and that the control group could therefore intrinsically differ from Re-ART. Third, the control group was small, because not all clients gave informed consent to participate, some youngsters received the adult version of Re-ART, and only cases with sufficient program integrity were included. This impaired the matching of subjects. We included various background variables to test for differences between the groups (which were absent); however, a posteriori correction of group differences does not guarantee exclusion of all potential explanations for intervention effects [86]. After all, we cannot be sure whether all variables that are relevant for any group differences are included in the measures [87]. Future (quasi-)experimental research should address actual recidivism with adequate sample sizes in various forensic facilities. Furthermore, dropout rate in both the Re-ART group and control group was around one-third. Even though dropout is usually relatively high in forensic treatment due to lack of motivation, this is considerable and indicates that the responsiveness of the treatment offer might be improved. Also, this means that the practical effects from Re-ART (intention to treat) will be less favorable than the current results. Furthermore, the absence of later follow-up assessments means that no statements about the stability of the effects over time could be made. Other potentially relevant future topics include a direct comparison between Re-ART and Dialectical Behavior Therapy.

Strengths that can be identified include the assessment of problem behavior by both therapist and client, rather than relying on one-sided report. Furthermore, research including a TAU control group is scarce, but nevertheless necessary to provide inferences about treatment efficacy. The current study compared a promising intervention with three types of treatment that are embedded as established interventions in the field. The quality of (forensic) mental health care is relatively high in the Netherlands, and differences between treatment groups therefore are generally small [88]. The current findings hold relevance, given the large effect sizes in a relatively small sample. The current results show that forensic treatment, such as Re-ART, incorporating both a systemic and individual approach, CBT elements, and RNR principles, is a valuable addition to the field. Re-ART showed substantial improvements in important areas related to aggressive behavior such as risk of violent recidivism, impulsivity, copings skills, and certain cognitive distortions. We conclude that there are indications to further investigate the effects of Re-ART Outpatient as a forensic intervention for adolescents and young adults with aggressive behavior in an outpatient setting, which in this study showed favorable results compared with treatment as usual.

CONFLICT OF INTEREST

Dr. Larissa M. Hoogsteder is the developer and owner of RE-ART and a Re-ART trainer and consultant.

ORCID

Eveline E. Schippers https://orcid.org/0000-0001-8014-9558

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