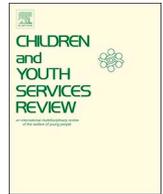




ELSEVIER

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

The outcome of non-residential youth care compared to residential youth care: A multilevel meta-analysis*

Raymond V. Gutterswijk^{a,b,*}, Chris H.Z. Kuiper^{b,c}, Navisha Lautan^b, Elsemieke G. Kunst^d, Frank C.P. van der Horst^a, Geert Jan J.M. Stams^e, Peter Prinzie^a

^a Department of Psychology, Education & Child Studies, Erasmus University Rotterdam, Burgemeester Oudlaan 50, 3062 PA Rotterdam, the Netherlands

^b Horizon Youth Care and Special Education, Mozartlaan 150, 3055 KM Rotterdam, the Netherlands

^c Social Work and Applied Psychology, University of Applied Sciences, Zernikedreef 11, 2333 CK Leiden, the Netherlands

^d Criminal Law and Criminology, VU University, De Boelelaan 1105, 1081 HV Amsterdam, the Netherlands

^e Forensic Child and Youth Care Sciences, University of Amsterdam, Nieuwe Achtergracht 127, 1018 WS Amsterdam, the Netherlands

ARTICLE INFO

Keywords:

Foster care treatment
Home-based treatment
Residential youth care
Meta-analysis
Behavioral problems
Effectiveness

ABSTRACT

Objective: This multilevel meta-analysis compared the outcomes of Treatment Foster Care Oregon for Adolescents (TFCO-A) and home-based treatment programs (HBT) with residential youth care for children and youth aged 0 to 23 years.

Methods: A total of 145 effect sizes for different types of behavioral problems were derived from 24 controlled studies ($n = 16,943$ participants). A three-level random-effects meta-analysis was conducted.

Results: We found a small statistically significant overall effect ($d = 0.21$), 95% CI [0.090-0.338], which indicated that non-residential youth care was slightly more effective than residential youth care. However, moderator analysis revealed that TFCO-A yielded a larger effect size ($d = 0.36$) than HBT ($d = 0.08$).

Conclusions: Our findings suggest that youth treated in treatment foster care have better outcomes than youth in residential care, which is not true for children who are treated at home. Therefore, in case of out-of-home placement treatment foster care should be the first option. Given that residential care has no additional value for youth who are treated at home, and often sets limits to juveniles' needs for self-determination, residential care seems an option if TFCO-A is not available and living at home is no longer possible because the child's (immediate) safety is at stake.

1. Introduction

There is an ongoing debate on how to effectively treat youth with complex needs who are at risk for out-of-home placement, especially (therapeutic) round-the-clock care in residential settings (Whittaker et al., 2016). These youths experience severe problems in behavioral functioning at home, in school and during leisure activities (Attar-Schwartz, 2009; Eltink et al., 2017; Frensch, & Cameron, 2002; Leloux-Opmeer, Kuiper, Swaab, & Scholte, 2017; Martín, González-García, Del Valle, & Bravo, 2018). The most common reason for referral of a youth to residential care is the presence of serious parenting and behavioral problems (Ainsworth, 2017; Bruning & De Jong-De Kruijff, 2015; Leloux-Opmeer et al., 2017; Martín et al., 2018). Alternatively, youth may be placed in a (forensic) secure residential institution after having

committed a crime. Residential youth care, however, is the most intensive and most expensive type of youth care, which substantially restricts autonomy of children and adolescents and deprives them of family life, which is particularly undesirable for youth who are placed in residential care because home-based treatment or foster care is not available (Busschers & Konijn, 2019) or due to long-term under-treatment of severe behavior problems (Broeders, Van der Helm, & Stams, 2015). Residential youth care may even cause harm when youths are exposed to institutional repression or negative peer influences (De Valk, Kuiper, Van der Helm, Maas, & Stams, 2016; Dishion, McCord, & Poulin, 1999). Residential youth care is therefore mostly seen as a 'placement of last resort'.

The last decade, serious doubts have been raised about the effectiveness and appropriateness of residential youth care (Souverein, Van

* Funding: this research was funded by Reformed Civil Orphanage Rotterdam.

* Corresponding author at: Horizon Youth Care and Special Education, Mozartlaan 150, 3055 KM Rotterdam, the Netherlands.

E-mail addresses: gutterswijk@essb.eur.nl (R.V. Gutterswijk), kuiper.c@hsleiden.nl (C.H.Z. Kuiper), vanderhorst@essb.eur.nl (F.C.P. van der Horst), g.j.j.m.stams@uva.nl (G.J.J.M. Stams), prinzie@essb.eur.nl (P. Prinzie).

<https://doi.org/10.1016/j.childyouth.2020.104950>

Received 18 November 2019; Received in revised form 19 March 2020; Accepted 19 March 2020

Available online 20 March 2020

0190-7409/© 2020 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

der Helm, & Stams, 2013), in particular with respect to juveniles' need for self-determination (Van der Helm, Kuiper, & Stams, 2018). A meta-analysis by De Swart and colleagues (2012) showed that protocolled evidence-based treatment delivered in residential care was mostly effective if compared with residential care as usual, whereas the comparison with non-residential care yielded a small and non-significant negative effect (Cohen's $d = -0.20$). This result was replicated in a more recent meta-analysis by Strijbosch and colleagues (2015), who found a small but statistically significant negative overall effect comparing outcomes of residential care to non-residential care ($d = -0.33$). However, a drawback of both meta-analyses is that no attempt was made to account for initial differences between youth receiving residential and non-residential care. In the present meta-analysis, we compare effects of residential youth care with non-residential youth care, in particular Treatment Foster Care Oregon for Adolescents (TFCO-A) and Home-Based Treatment (HBT), because these types of care are well-researched, controlling for initial differences between participants by means of matching or random assignment to both conditions and control for (eventual) remaining individual differences at pre-test in our meta-analytic analyses.

1.1. Residential youth care

Residential youth care is a 24-hour mental health intervention for youth with severe emotional and/or behavioral problems, mostly from a dysfunctional family, in particular with respect to aversive child-rearing practices and inadequate parenting (Harder, 2011). Residential placement is mostly involuntary, mandated by civil or penal law (i.e., juvenile delinquents). Care is offered in a highly supervised and structured living group setting, where individual therapies can be provided, in addition to group treatment, if applicable. Residential institutions can be large scale, with different levels of security, or small scale therapeutic settings. Youth attend day schools within the residential youth care institution or receive education outside the residential facility (Preyde et al., 2011b).

Residential care is mostly based on behavioral, cognitive or solution focused models (Van der Helm & Hanrath, 2011; Whittaker, Del Valle, & Holmes, 2015), and in some cases involves evidence-based manualized treatment. Furthermore, a positive group climate is considered to be a first necessary, but not sufficient, condition for effective treatment and positive youth outcomes in residential care (Van der Helm & Hanrath, 2011). Eltink and colleagues (2019) conducted a meta-analysis on the association between residential group climate and antisocial behavior, distinguishing between seven dimensions of group climate: support, growth, structure, experienced safety, justice, atmosphere, and repression. Results showed that a therapeutic group climate was significantly and modestly related to lower levels of antisocial behavior, with the largest effect size for experienced safety ($r = 0.288$).

1.2. Non-residential care

The last decades several programs have been developed as alternative to residential or institutional youth care. Treatment Foster Care Oregon for Adolescents (TFCO-A), formerly known as multi treatment foster care (MTFC), aims to reduce deviant behavior (Bergström & Højman, 2016; Chamberlain, Leve, & DeGarmo, 2007; Sinclair et al., 2016), and delinquent activity in youth (Chamberlain & Reid, 1998). TFCO-A also aims to reinforce prosocial behavior (Bergström & Højman, 2016; Chamberlain et al., 2007) by encouraging participation in structured social activities, social skills training, and fostering good relationships with parents and peers (Fisher & Chamberlain, 2000). TFCO-A consists of an out-of-home placement in a professionally trained foster family for 6 to 9 months. In addition, a clinical team is formed around the youth and his or her birth family (Fisher & Chamberlain, 2000; Westermark, Hansson, & Olsson, 2011). The youth is offered a therapeutic and structured living environment, where

supervision, boundary setting, and supporting relationships are important. The most important difference with residential care is that the youth lives within a family context, and mostly receives education at a regular school (see e.g., The California Evidence-based Clearinghouse, 2018).

Another form of non-residential care, Home-based treatment (HBT), is offered to youth living at home. HBT targets youths with serious emotional and behavioral problems who are at risk of being placed out-of-home or return home from an out-of-home placement (Mattejat, Hirt, Wilken, Schmidt, & Remschmidt, 2001). By implementing HBT, organizations aim to improve the overall well-being of the family and reduce problems affecting the family (Preyde et al., 2011b). Recently, four types of HBT which are highly comparable in used mechanisms and techniques and in treatment effects have been compared with residential care (Van der Pol et al., 2017). These types of HBT are Intensive Home-Based Treatment (IHBT), Multidimensional Family Therapy (MDFT), Functional Family Therapy (FFT) and Multi-Systemic Therapy (MST).

Intensive Home-Based Treatment (IHBT) is defined as all out-patient youth care for more than one hour per week. IHBT promotes positive development and adequate family functioning. IHBT addresses mental health issues and is available 'around the clock'. IHBT is offered both individually and systemically (Moffett, Brotnow, Patel, Adnopo, & Woolstone, 2017). In their meta-analysis on the outcomes of wrap-around care, Suter and Bruns (2009) found a small statistically significant effect (Cohen's $d = 0.33$) on youths' mental health and overall functioning.

Multidimensional Family Therapy (MDFT) offers help to youth with multiple problems behavior. The purpose of MDFT is to make youths' problematic behavior disappear or decrease and improve youths' functioning within the family, in school or work, and in daily life. The therapists using MDFT involve family, friends, school, work and promote leisure activities. Furthermore, the meta-analysis performed by Van der Pol and colleagues (2017) found a small, but significant, overall effect size ($d = 0.24$) of MDFT compared to other therapies on various behavioral outcomes.

Functional Family Therapy (FFT) is aimed at enabling the family to resolve problems themselves and to deal with setbacks, and works with 11- to 18-year old youths who have been referred for behavioral or emotional problems. FFT can be offered at home, in school or in a mental health facility (Robbins, Alexander, Turner, & Hollimon, 2016). Hartnett, Carr, Hamilton, and O'Reilly (2017) performed a meta-analysis on the effects of FFT on drug use, recidivism, family adjustment and behavioral problems, and found small statistically significant treatment effects compared to untreated control groups (Cohen's $d = 0.48$) and alternative treatments (Cohen's $d = 0.35$).

Multi-Systemic Therapy (MST) strongly focuses on the network at large, including the school, peers, and sports clubs (Henggeler, 2011), improving communication, parenting skills, peer relations, school performance, and social networks (Little, Popa, & Forsythe, 2005). Van der Stouwe, Asscher, Stams, Deković, and Van der Laan (2014) conducted a meta-analysis and reported that MST produced small statistically significant positive effects on delinquency (Cohen's $d = 0.20$), psychopathology (Cohen's $d = 0.27$), substance abuse (Cohen's $d = 0.29$), family factors (Cohen's $d = 0.14$), out-of-home placements (Cohen's $d = 0.27$), and peer factors (Cohen's $d = 0.21$).

1.3. The present study

In this multilevel meta-analysis, we compare the outcomes of two well-researched types of non-residential interventions that target youth with complex problems at risk for out-of-home placement – Treatment Foster Care Oregon for Adolescents (TFCO-A) and home-based treatment (HBT) – with the outcomes of residential youth care. We only include controlled studies comparing TFCO-A or HBT to residential youth care, reporting on internalizing, externalizing, and total

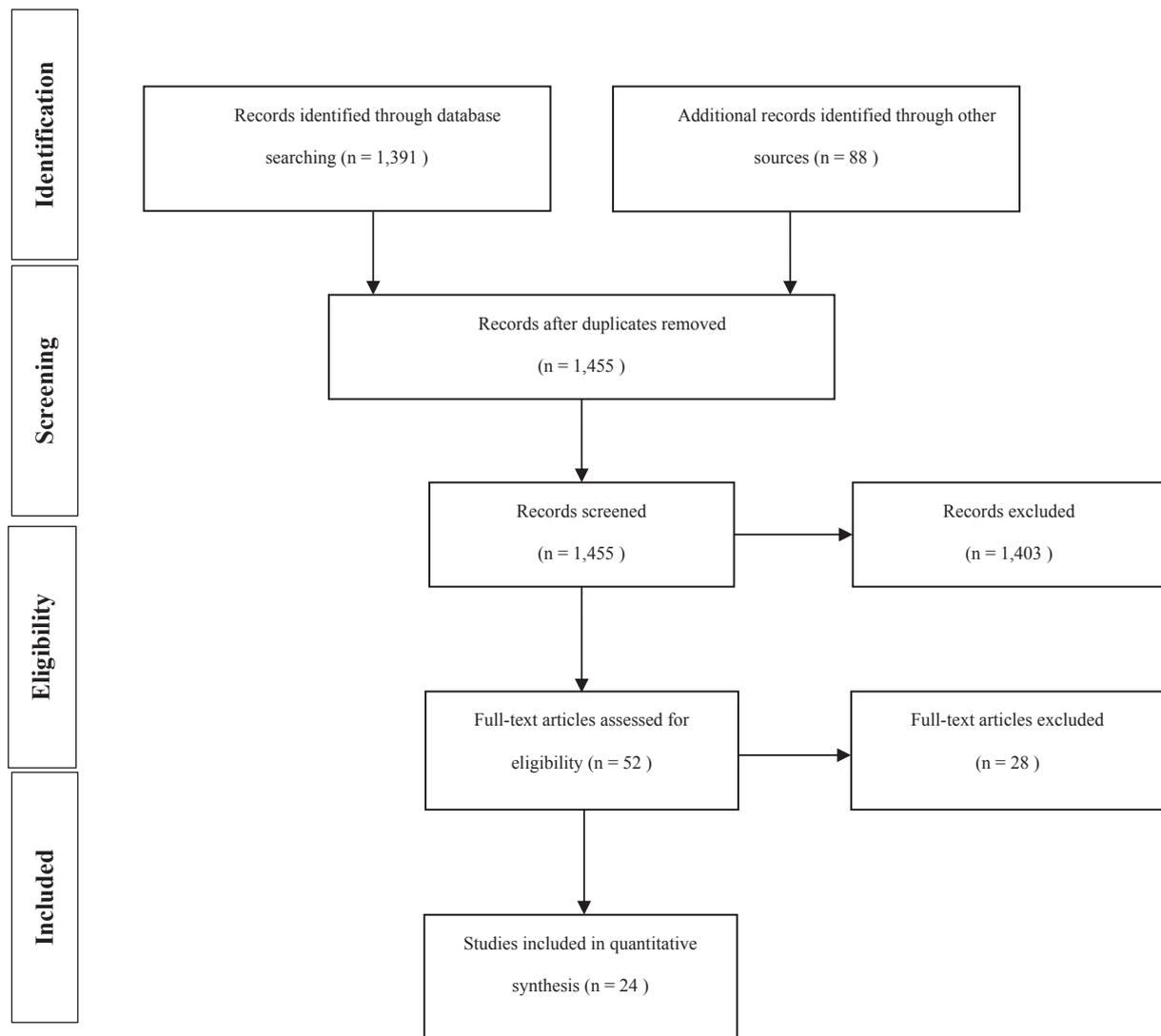


Fig. 1. Flowchart showing the results of the search strategy.

behavioral problems, substance misuse and delinquency for children and adolescents aged 0 to 23 years. This meta-analysis is innovative because, in contrast with the meta-analyses of [Strijbosch and colleagues \(2015\)](#) and [De Swart and colleagues \(2012\)](#), in the present meta-analysis (1) initial differences between youth receiving residential and non-residential care are accounted for by means of study design (matching or randomization) and control for pre-test differences; and (2) not only differences in effect sizes between studies, but also within studies are taken into account by means of recent developed meta-analytic techniques ([Assink & Wibbelink, 2016](#)). We thus gain knowledge on differences between the outcomes of residential and non-residential youth care in children and adolescents with comparable problems and supposedly risks for out-of-home placement, and the conditions under which these outcomes differ. This knowledge can be used to inform clinical practice and policies on the delivery of residential and non-residential youth care.

Overall and based on the literature, we hypothesize that non-residential youth care will produce more favorable outcomes than residential youth care, because residential care may have a negative effect on the developmental possibilities and treatment motivation of youth by: (1) not meeting the fundamental requirements for self-determination (i.e., competence development, contact and autonomy); (2) the association with deviant peers and deviancy training; (3) high risks for institutional repression; (4) the unavailability of evidence-based

manualized treatment; (5) the cut off from primary supportive attachment-based relationships; and (6) problems in establishing supportive (therapeutic) youth-staff relationships ([De Valk et al. 2016](#); [Souverein, Van der Helm, & Stams, 2013](#); [Van der Helm, Kuiper, & Stams, 2018](#)).

In moderator analyses we examine the degree to which the overall effect size for differences in youth outcomes between residential and non-residential care is affected by sample characteristics (e.g., mean age, sex and ethnicity), methodological characteristics (e.g., study design, quality of the study and control for pre-test), and study characteristics (e.g., impact factor, type of intervention and year of publication). These moderators are included in meta-analyses as a rule, because they control for methodological influences and publication characteristics or concern generalizability of results.

In previous meta-analyses comparing effectiveness of non-residential and residential care, moderation effects were found for gender ([Strijbosch et al., 2015](#)), but not for age ([De Swart et al., 2012](#); [Strijbosch et al., 2015](#)), showing that studies with a high percentage of females were associated with smaller effect sizes. In the meta-analysis by [Strijbosch and colleagues](#), study design (i.e., randomized controlled trial, matched or non-matched control group) was a significant moderator, showing that matched studies yielded better outcomes for youth in non-residential care, whereas non-matched studies showed better outcomes for youth in residential care. However, study design was non-significant as a moderator in the meta-analysis by [De Swart et al.](#). In

contrast to the meta-analysis of De Swart and colleagues (2012), the meta-analysis of Strijbosch and colleagues (2015) showed a significant moderator effect for type of outcome. Year of publication was a significant moderator in both meta-analyses indicating that earlier published studies yielded greater effect sizes. Finally, De Swart et al. found a moderator effect for the type of intervention, with only positive effects for cognitive behavior therapy.

2. Methods

2.1. Study selection

We searched for studies on residential youth care in several electronic databases: Pubmed, SAGE Journals, ScienceDirect, SpringerLink, Wiley Online Library, MEDLINE, Web of Science, CINAHL, Psycinfo, Cochrane Library, Campbell Library, Proquest and Google Scholar. To cover the terms child, residential care, antisocial behavior and treatment effect, we used the following set of keywords: youth, child*, adolescen*, boy*, girl*, juvenile*, residential care, residential homes, institutional care, group care, group homes, problem behavior*, behavior* problems, aggres*, violen*, criminal behavior*, antisocial behavior*, externalizing, delinquen*, internalizing, anxiety, depression, effect* and comparison. In addition, we inspected the reference lists of the studies we included in this meta-analysis. Finally, two researchers searched independently the indexes of the most relevant journals. The final search was performed on September 4, 2019.

2.2. Inclusion criteria

Studies that met the following conditions were included: (1) the (quasi-) experimental group or the control group received home-based treatment or Treatment Foster Care Oregon for Adolescents, (2) the other group received residential care, (3) the studies provided at least post-test scores or follow-up scores for both groups and (4) were written in English or Dutch. We included a total of 24 studies ($N = 16,943$) (see Fig. 1). The literature search was performed by three researchers. When in doubt whether a study did meet the inclusion criteria, the three researchers discussed what to do until consensus was reached. No unpublished relevant studies were found. The reason to exclude studies on the basis of the full-text was mainly because the control group or outcome measures did not meet the inclusion criteria.

Two researchers coded all available outcome variables of the studies we included in the meta-analysis. The first five studies were coded independently by both researchers. Inter-rater reliability was analyzed by calculating Kappa for categorical variables and intraclass correlation (ICC) for variables at the interval and ratio level. This inter-rater reliability was moderate to nearly perfect, according to the guidelines by Landis and Koch (1977). Our Kappa's ranged from 0.70 to 1.00 and intraclass correlations from 0.99 to 1.00. In one case, the Kappa proved to be insufficient, yielding a score of 0.54 which problem was resolved through further discussion until consensus was reached. A limitation of ICC is that it does not include missing values in the analysis. When one researcher coded a variable and the other did not, this is a violation of interrater reliability, but is not taken into account in intraclass correlation analyses. Overall, coding on interval and ratio level by the two researchers corresponded in 76.4% of the cases. Although the fact that these results show sufficient reliability, the analysis led to even more discussion between the researchers about the coding, which resulted in increased reliability.

Moderators were coded and were categorized as follows: (1) sample characteristics, (2) methodological characteristics, and (3) study characteristics. These sample characteristics were mean age, sex (percentage male) and ethnicity (percentage Caucasian white, percentage African black, and percentage Hispanic) and methodological characteristics were study design (RCT, matched or non-matched) and study quality (strong, moderate or weak) according to the EPHPP 'Quality

Assessment Tool for Quantitative Studies (Armijo-Olivo et al., 2012). Other methodological characteristics were research group (group Preyde, group Chamberlain, group Henggeler or other group), control for pre-test (control for pre-test or no control for pre-test) and intention-to-treat (i-t-t or completers). And lastly, measured outcomes (externalizing behavior problems, internalizing behavior problems, total behavior problems, delinquency and substance abuse), type of measurement (questionnaire, interview or other), informant (youth, parent or other), time of measurement (post-test or follow-up) and follow-up in months. Furthermore, study characteristics were impact factor, year of publication and type of intervention (homebased care or Treatment Foster Care Oregon for Adolescents). Because of a shortage of studies, and the need for sufficient statistical power, we were not able to divide home-based care into IHBT, MDFT, FFT, and MST for the purpose of moderator analyses.

2.3. Publication bias funnel plot

Studies reporting strong significant results are more likely to be published in peer-reviewed journals. Studies reporting less strong or no statistically significant results are therefore harder to find. To examine file drawer bias, a funnel plot of the distribution of effect sizes can be used (Rosenthal & Hershstein, 1979). In a funnel plot, each effect size is plotted on the horizontal axis against its sample size, standard error or precision on the vertical axis. This distribution is shaped as a funnel if no publication bias is present. A violation of funnel plot symmetry indicates publication bias. By regressing the standard normal deviate, defined as the effect size divided by its standard error, against the estimate's precision, funnel plot asymmetry can be tested. If there is asymmetry, the regression line does not run through the origin and the intercept significantly deviates from zero (Duval & Tweedie, 2000).

2.4. Analyses of effect sizes

To analyze our data, we used a random effects model (Sánchez-Meca & Marín-Martínez, 2008). We calculated Cohen's d for group comparisons, using the Practical Meta-Analysis Effect Size Calculator developed by Wilson (2001). Cohen's d was calculated by using means and standard deviations, proportions and t -, F -, χ^2 -, p -values. For 128 of 145 effect sizes it was possible to control for pre-test scores.

The multilevel meta-analysis was conducted in R (version 3.5.1), using the metaphor-package (Viechtbauer, 2017). In a three-level meta-analysis, variance at three different levels is analyzed: (1) sample variance, (2) variance between effect sizes within studies, and (3) variance among effect sizes between studies (Assink et al., 2018; Van den Noortgate, López-López, Marín-Martínez, & Sánchez-Meca, 2013). The multilevel technique allows not only to calculate an overall effect size, but if significant variance is present at level 2 and/or 3, moderation by sample, methodological and/or study characteristics can be examined. This is an important improvement, because commonly used meta-analytic methods assume independency of effect sizes, whereas this usually is not the case. The method also allows for the use of multiple effect sizes (within studies) from the same sample (Assink & Wibbelink, 2016). Moderator analyses were also performed using R (Viechtbauer, 2017).

3. Results

3.1. Study characteristics

This meta-analysis included $k = 24$ primary studies from which $u = 145$ effect sizes were extracted (see Appendix A). On average, 6.04 effect sizes were extracted from each included study ($SD = 5.06$; range = 1–20). The studies were published between 1992 and 2018, and the median year was 2005. Almost all studies were conducted in North-America ($k = 22$), with only two European studies.

Table 1
Overall effect of non-residential youth care on child outcomes compared to residential youth care.

Outcome	k	#ES	Mean d	95% CI	Sig. mean d (p)	$\sigma^2_{\text{level } 2}$	$\sigma^2_{\text{level } 3}$	% Var. Level 1	% Var. Level 2	% Var. Level 3
Child- outcomes	24	145	0.21	0.00; 0.34	0.00***	0.12***	0.06***	6.61	61.60	31.79

Note. Child outcomes = internalizing problem behavior, externalizing problem behavior, substance use, delinquency and total problems; k = number of studies; #ES = number of effect sizes; mean d = mean effect size (Cohen's d); CI = confidence interval; $\sigma^2_{\text{level } 2}$ = variance between effect sizes extracted from the same study; $\sigma^2_{\text{level } 3}$ = variance between studies; % Var = percentage of variance distributed.

*** p ≤ 0.001.

3.2. Overall effect size

The estimated overall effect of non-residential care on behavioral problems, compared to residential youth care, was $d = 0.21$, $p \leq 0.001$, 95% CI [0.090, 0.338] (see Table 1), indicating that youth in non-residential care showed statistically significantly better outcomes than youth in residential care. According to Rice and Harris (2005) this is a small effect. Significant level 2 and level 3 variance was found. This significant variance implies substantial variability in effect sizes extracted from the same study (level 2) and from different studies (level 3) (see Table 1). As presented in Table 1 about 62% of total variance could be explained by within-study differences in effect sizes (level 2) and about 32% by between-study differences in effect sizes (level 3). Therefore, moderator analyses were conducted to explore whether moderators could explain the level 2 and 3 heterogeneity.

Furthermore, a visual inspection of the funnel plot did not lead to a suspicion of publication bias, which was confirmed by the trim-and-fill analysis in R, which revealed that no effect sizes had to be imputed at the left or right side of the funnel (see Fig. 2).

3.3. Moderator analyses

In Table 2, the results of within-study moderator analyses are presented. In Table 3, the between-study moderator analyses are presented. The moderators are classified into 'sample characteristics', 'methodological characteristics' and, 'study characteristics'.

3.3.1. Within-study: Methodological characteristics

We found no moderating effect of the measured outcomes (total behavior problems, internalizing behavior problems, externalizing behavior problems, substance abuse or delinquency), type of measure (questionnaire, interview or official registration), information source (child, parent or other), measurement moment (post-test or follow-up) or number of months before follow-up.

3.3.2. Between-study: Sample characteristics

We found no moderating effect of percentage male, age, percentage Caucasian white, percentage African black or percentage Hispanic.

3.3.3. Between-study: Methodological characteristics

Moderator analysis revealed a statistically significant moderating effect for type of intervention (see Table 3). TFCO-A yielded a larger effect ($d = 0.36$) on behavioral problems than HBT ($d = 0.08$), indicating TFCO-A to be slightly more effective than residential youth care, whereas HBT proved to be equally effective. No moderating effects were found for year of publication, intention to treat, study design, study quality, author, control for pretest or impact factor of the journal the study was published in.

4. Discussion

The main aim of this meta-analysis was to examine the outcomes of non-residential care compared to residential care for youth aged 0 to 23 years, which revealed that TFCO-A yielded a larger effect size (Cohen's $d = 0.36$) than HBT (Cohen's $d = 0.08$). These findings

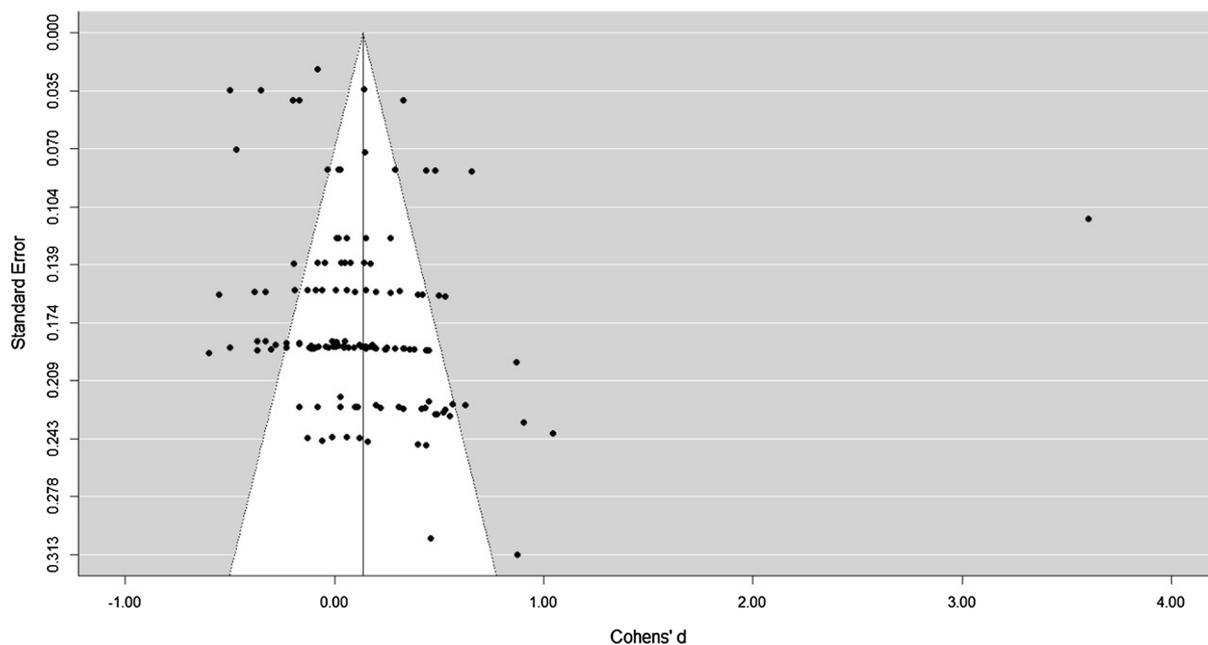


Fig. 2. Trim and fill plot for all effect sizes. Note. A contour enhanced funnel plot with Cohen's d on the X axis and standard error on the Y axis. The black dots represent the extracted effect sizes. If there were any imputed effect sizes, they would be represented by white dots. The solid vertical line represents the overall effect size.

Table 2
Within-study moderators of the effectiveness of non-residential care: assessment of outcomes.

Moderator variable	k	#ES	B ₀ /d	t ₀	B ₁	t ₁	F(df ₁ , df ₂)
Methodological characteristics							
<i>Measured outcomes</i>							
Total behavior problems	10	24	0.04	0.35			F(4, 140) = 1.67
Internalizing behavior problems	12	45	0.21	2.53*	0.17	1.62	
Substance abuse	5	13	0.12	0.88	0.09	0.53	
Delinquency	14	34	0.35	3.78***	0.31	2.37	
Externalizing behavior problems	11	29	0.14	1.53	0.10	0.95	
<i>Approaches to Outcome Measurement</i>							
<i>Type of Measure</i>							
Questionnaires	17	93	0.16	2.18*			F(2, 136) = 2.24
Interview	3	25	0.14	1.12	-0.02	-0.14	
Official registration	11	21	0.42	3.69***	0.26	2.08	
<i>Informant</i>							
Child	14	53	0.28	3.06*			F(2, 142) = 0.51
Parent	10	41	0.16	1.75	-0.12	-0.99	
Other	19	51	0.20	2.54*	-0.08	-0.77	
<i>Time of measurement</i>							
Post-test	9	48	0.20	2.80**			F(1, 143) = 0.26
Follow-up	18	97	0.26	2.70**	0.05	0.51	
Follow-up months	18	103	0.17	3.33**	0.00	0.76	F(1, 101) = 0.57

Note. k = number of independent studies; #ES = number of effect sizes; B₀/mean r = intercept/mean effect size (r); t₀ = difference in mean r with zero; B₁ = estimated regression coefficient; t₁ = difference in mean r with reference category; F(df₁, df₂) = omnibus test; (RC) = reference category. + p < .10; * p < .05; ** p < .01; *** p < .001.

indicate that treatment foster care was slightly more effective than residential care, whereas home-based care proved to be equally effective. The positive effects of non-residential (foster) care of this multilevel meta-analysis are largely in line with findings of the meta-analyses by

De Swart and colleagues (2012) and Strijbosch and colleagues (2015), who found small (Cohen's d = 0.20) and small-to-medium (Cohen's d = 0.34) effects, respectively, favoring non-residential over residential youth care. Therefore, the combined findings of previous meta-analyses

Table 3
Between-study moderators of the effectiveness of non-residential care: child and methodological characteristics.

Moderator variable	k	#ES	B ₀ /d	t ₀	B ₁	t ₁	F(df ₁ , df ₂)
Sample characteristics							
Sex	24	145	0.20	3.18**	-0.00	-0.99	F(1, 143) = 0.99
Age	21	140	0.17	3.51***	0.02	0.76	F(1, 137) = 0.58
<i>Ethnicity</i>							
Percentage Caucasian White	17	94	0.25	3.17**	0.00	1.17	F(1, 927) = 1.37
Percentage African Black	17	87	0.27	3.50***	-0.00	-1.30	F(1, 85) = 1.68
Percentage Hispanic	15	84	0.18	2.83*	-0.00	-1.26	F(1, 82) = 1.58
Methodological Characteristics							
<i>Study design</i>							
RCT	13	73	0.27	3.05**			F(2, 142) = 0.73
Quasi experimental matched	7	28	0.22	1.81	-0.05	-0.29	
Quasi exp. non-matched	4	44	0.07	0.46	-0.20	-1.21	
<i>Study quality</i>							
Strong	8	56	0.29	2.65**			F(2, 137) = 0.38
Moderate	8	57	0.20	1.77	-0.09	-0.58	
Weak	8	32	0.15	1.25	-0.14	-0.85	
<i>Research group</i>							
Other group	11	62	0.22	2.59*			F(3, 141) = 1.93
Group Preyde	4	44	0.01	0.05	-0.21	-1.43	
Group Chamberlain	6	22	0.41	3.40***	0.19	1.27	
Group Henggeler	3	17	0.12	0.78	-0.10	-0.57	
<i>Control for pretest</i>							
Control for pretest	20	129	0.33	2.27*			F(1, 143) = 0.74
No control for pretest	5	16	0.19	2.79**	-0.14	0.86	
<i>Intention to treat</i>							
Completers	11	64	0.23	2.40*			F(1, 143) = 0.02
Intention to treat	14	81	0.21	2.44*	-0.02	-0.12	
Study characteristics							
<i>Type of experimental group</i>							
Homebased Services	12	99	0.08	1.11			F(1, 143) = 6.10*
TFCO-A	12	46	0.36	4.28***	0.28	2.47	
Impact factor	21	113	0.25	3.14**	-0.01	-0.19	F(1, 111) = 0.04
Year of publication	24	145	0.21	3.27**	-0.00	-0.21	F(1, 143) = 0.04

Note. k = number of independent studies; #ES = number of effect sizes; B₀/mean r = intercept/mean effect size (r); t₀ = difference in mean r with zero; B₁ = estimated regression coefficient; t₁ = difference in mean r with reference category; F(df₁, df₂) = omnibus test; (RC) = reference category. + p < .10; * p < .05; ** p < .01; *** p < .001.

and the present meta-analysis suggest that treatment foster care should be preferred above residential youth care in case of out-of-home placement.

All moderators, except for type of intervention (TFCO-A or HBT), turned out to be statistically non-significant, which indicates that there was no difference in the effect of non-residential care compared to residential care for boys and girls, young children and adolescents, youth of different ethnic backgrounds and measured outcome. In line with our findings, De Swart and colleagues (2012) found no significant moderator effects for gender, age, ethnicity and type of measured outcome either. However, the findings of Strijbosch and colleagues (2015) differed from our findings in the sense that samples with a larger percentage of females yielded smaller effect sizes. Notably, Sawyer, Borduin, and Dopp (2015) found smaller effect sizes for samples with more boys in their meta-analysis of the long-term effects of prevention and treatment of youth with antisocial behavior. While several authors claim that boys and girls are in need of a different approach (Baker, Archer, & Curtis, 2005; Herman, 1997; Zahn, Day, Mihalic, & Tichavsky, 2009), our findings suggest that girls and boys benefit in a similar way from treatment foster care if compared to residential care, although boys and girls may be selected for similarity, such as similar problem behaviors.

The time of measurement yielded no moderating effect either, indicating that the difference in effect between non-residential and residential care is stable over time, similar to results of the meta-analysis by De Swart and colleagues (2012). In addition, we did not find a moderating effect of measured outcomes, whereas Strijbosch (2015) found that non-residential care was more effective than residential care in reducing delinquency, but not more effective in producing positive outcomes in other domains of youth functioning. Our study indicates that the more positive treatment effects of foster care, in particular TFCO-A, pertain to all outcomes, including both internalizing and externalizing problems.

4.1. Implications for clinical practice and future research

Results of this meta-analysis and those of De Swart and colleagues (2012) and Strijbosch and colleagues (2015) indicate that treating a youth through non-residential care has a more positive effect than treating the youth within residential care. The great advantage of non-residential youth care is that the youth lives within a family and the parents of the youth can more easily be involved in treatment (Fischer & Chamberlain, 2000; Mattejat et al., 2001), instead of reducing opportunities for contact with the family in residential care (James, 2017).

Another important advantage of non-residential care is that potential iatrogenic effects of residential care are avoided, although these negative effects have been contested in several studies (Huefner, Handwerk, Ringle, & Field, 2009; Huefner & Ringle, 2012; Lee & Thompson, 2009). There is some empirical evidence showing that working on a therapeutic residential group climate may neutralize possible iatrogenic effects (Stams & Van der Helm, 2017). These iatrogenic effects may in particular be caused by 'deviancy training'. This means that deviant peers reinforce each other's antisocial behaviors when care is provided to a group instead of individually (Dishion, Poulin, & Burraston, 2001; Weiss et al., 2005). Furthermore, residential youth care is a very intensive and expensive type of youth care, restricting youths' autonomy (James, 2017; Knorth et al., 2007), and their need for self-determination (Van der Helm et al., 2018). In general, a trajectory in TFCO-A is less expensive than a placement in secure residential youth care. TFCO-A, however, is slightly more expensive than a placement in residential youth care if length of stay is comparable (Åström et al., 2019). This is why serious doubts have risen about the

effectiveness and appropriateness of secure residential youth care (Souverein et al., 2013).

Although the outcomes for youth in non-residential care were only slightly better than those for youth in residential care, these small improvements can be meaningful in the long run. A small effect can be very important in some cases, especially if interventions target severe problems, in this particular case, severe behavioral problems in youth (Thompson, 2007). Notably, our research findings were based on multiple studies, accounting for both within and between study heterogeneity. The results of this meta-analysis indicate that for many youth non-residential care is the preferred option, especially TFCO-A, both in terms of achievement of therapeutic objectives and cost-effectiveness (McCartney & Rosenthal, 2000). However, we are aware that TFCO-A is only available to a limited extent. We therefore strongly recommend that the availability of TFCO-A be expanded, for example, by replacing a part of residential youth care by TFCO-A. Nevertheless, it cannot be ruled out that there still may be a specific group of the most troubled youths, such as adolescents with psychopathic traits (Asscher et al., 2011) or early onset conduct disorder (Wibbelink, Hoeve, Stams, & Oort, 2017), who are unsuitable for treatment at home or in foster care, and for whom residential youth care is the only viable option. Sometimes behavioral problems are so severe that youths are unmanageable within their own family or even in a foster family, with high risks of foster care placement instability (Konijn et al., 2019; Van den Bergh, Weterings, & Schoenmakers, 2011).

If we want to prevent youth from entering residential care, we need to find out when youth should still be referred to residential care or sentenced to detention, when no alternative sanction is allowed, and how alternative interventions can be developed for youth who depend on residential youth care because of their special needs or due to safety reasons. It is therefore important to know what the treatment needs are of these youths, and how their social environment may be supported and strengthened in order to prevent residential out-of-home placement, for instance by applying formal (Raposa et al., *in press*) or informal (Van Dam et al., 2017, 2018) mentoring. It must also become clear under what conditions youths at risk for residential placement cannot be treated through (forensic) foster care or home-based interventions, including family-style group care (Leloux-Opmeer et al., 2017). And if so, in what way (foster) families can be supported to overcome the risks of placement breakdown (See Konijn et al., 2019). Notably, the views and experiences of the youth themselves and their parents cannot be ignored when developing the most appropriate care for each youth. Lastly, Whittaker and colleagues (2016) state, that if treatment within residential care is unavoidable, it is useful to (1) offer help in closer collaboration with parents and other informal social network members, while the safety of the youth remains guaranteed, (2) make sure (therapeutic) residential care meets quality standards, is carefully monitored and properly designed, and (3) add intensive (foster) family-based interventions.

4.2. Limitations

The present meta-analysis has a number of limitations that need to be discussed in order to be able to fully appreciate our meta-analytic results, and prevent overinterpretation of our research findings. Notably, several limitations are shortcomings of the primary studies included in our meta-analytic review. Unfortunately, we could not include characteristics of residential care (e.g., level of security, availability of evidence-based treatment, the distinction between large scale institutional youth care and small-scale therapeutic residential care, group climate), intelligence of the youth, treatment integrity and length of residential stay as moderators in our analyses, because the included articles did not report sufficient data on these characteristics. We are

aware that the content of residential youth care may vary between different organizations, and that residential care is not as well researched as TFCO-A and the different forms of home-based treatment, and is rarely manualized, which may explain differences in outcomes of residential and non-residential care, such as better results for youth receiving TFCO-A than residential youth care (the present meta-analysis). However, 'established' and standardized non-residential interventions are often not carried out with high levels of treatment integrity, rendering these interventions ineffective, in particular for youth with conduct problems (See e.g., Goense et al., 2016). Moreover, Weisz et al. (2017) conducted a comprehensive meta-analysis of five decades of research on protocolled youth psychological therapy, showing no positive outcomes for youth with complex problems, in fact, those children or adolescents who may be at risk for out-of-home placement, and receive residential care, foster care or home-based care. Nevertheless, a meta-analysis by Van Stam et al. (2014) on the effectiveness of EQUIP and a study by Hoogsteder, Stams, Schippers and Bonnes (2018) on the effectiveness of Responsive Aggression Regulation Therapy showed positive effects of established manualized residential treatment on criminal recidivism in detained juvenile offenders.

De Swart et al. (2012) made an attempt to compare evidence-based residential treatment with evidence-based non-residential treatment, but they found only one study (Wilmshurst, 2002), favoring home-based treatment at one year follow-up: youth receiving home-based treatment showed a reduction in symptoms of ADHD and internalizing problems, whereas youth receiving the residential program showed a clinical deterioration, resulting in increased internalizing problems. However, the goal of the present meta-analysis was to compare youth care in a professional residential setting, regardless of the specific content, with intensive home-based treatment (IHBT) and Treatment Foster Care Oregon for Adolescents (TFCO-A).

We solely included published studies in our meta-analysis, reducing the likelihood that results were based on lower quality research that had not been peer-reviewed, yet increasing the possibility of inherent publication bias. However, we found no indication of publication bias. Furthermore, although initial differences in problems at admission of youth served through non-residential and residential youth care were controlled through matching procedures, randomization and control for pre-test scores on outcome variables, we could not examine through moderator analysis whether the seriousness of the problems at admission affected the treatment outcome because a differentiation in relatively mild, moderate or high problem severity was not possible given the information provided in the included articles. Since, for example, Van der Pol and colleagues (2017) found that adolescents with more severe problems benefited more from MDFT, we recommend a fine-grained assessment of problem severity to be included in future studies on residential and non-residential care as a possible moderator of treatment outcome.

We were unable to conduct moderator analyses to distinguish between the effects of IHBT, MDFT, FFT, and MST due to a lack of studies, and the need for sufficient statistical power. However, findings of Van der Pol and colleagues (2019) show that these home-based interventions have much in common. They substantial overlap in the mechanisms and techniques used in MST, FFT, MDFT, brief strategic family therapy (BSFT), and even TFCO-A. For example, the mechanisms engagement, alliance, and interactional focus, and the techniques conflict management and communication skills were identified in all five treatments. Furthermore, there were twelve techniques and mechanisms found in four out of five treatment manuals, which further demonstrates the strong overlap between these interventions. Moreover,

Van der Pol and others (2017) showed that MDFT and other multiple systems-based treatment, such as MST (Van der Stouwe et al., 2014), all have similar small effects on substance abuse, family functioning, internalizing and externalizing behavioral problems, and delinquency.

Finally, not all youth at risk for residential placement may have been included in the studies that are reviewed in this meta-analysis, since they could not participate in a randomized control trial for ethical reasons or because judicial measures prevented participation. Moreover, matched-control studies only compare a specific part of the population of youth at risk for residential placement, probably not the most and least severe cases. These drawbacks limit the generalizability of our study findings, and indicate that there might still be adolescents with complex needs who should be referred to residential youth care facilities or sentenced to detention.

4.3. Conclusion

Our findings suggest that youth with complex problems should be helped through non-residential care, especially treatment foster care, because this care yields slightly better results than residential care in reducing different types of behavioral problems, without the possible iatrogenic effects of residential care. These findings suggest that a part of residential care can be replaced by TFCO-A. Only in exceptional cases, when (treatment) foster care or home-based care cannot meet the safety needs of the youth, or is prohibited by judicial measures, residential youth care may be considered (Ainsworth, 2017). It is of major importance that alternative interventions be further developed and evaluated for those youth who are seen as unsuitable for foster care and home-based care. This is in line with our findings of better treatment outcomes for non-residential care, where (foster) family-based interventions are used, in close collaboration with parents and the informal network.

Funding

This study was funded by the Reformed Civil Orphanage Rotterdam, the Netherlands.

CRediT authorship contribution statement

Raymond V. Gutterswijk: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - original draft, Project administration, Funding acquisition. **Chris H.Z. Kuiper:** Conceptualization, Methodology, Validation, Writing - review & editing. **Navisha Lautan:** Formal analysis, Investigation, Data curation. **Elsemieke G. Kunst:** Formal analysis, Investigation, Data curation. **Frank C.P. van der Horst:** Conceptualization, Methodology, Validation, Writing - review & editing. **Geert Jan J.M. Stams:** Conceptualization, Methodology, Validation, Formal analysis, Data curation, Writing - review & editing. **Peter Prinzie:** Conceptualization, Methodology, Validation, Writing - review & editing, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Study characteristics of the studies in the meta-analysis

Authors and year of publication	World part of origin	Comparison	Design	Average age (years)	Gender	N of effect sizes
Barth et al. (2007)	North America	HBT vs group care	Matched control	0–16	mixed	1
Bergström & Højman (2016)	Western Europe	TFCO-A vs group care	RCT	12–17	mixed	2
Cameron, Frensch, Preyde, & Smit Quosai (2011)	North America	HBT vs group care	Non-matched	11,55	mixed	3
Chamberlain & Reid (1998)	North America	TFCO-A vs group care	RCT	11,4	mixed	4
Chamberlain, Leve, & De Garmo (2007)	North America	TFCO-A vs group care	RCT	15,3	female	4
Eddy, Whaley, & Chamberlain (2004)	North America	TFCO-A vs group care	RCT	14,9	male	3
Harold et al. (2013)	North America	TFCO-A vs group care	RCT	–	female	4
Henggeler et al. (1999)	North America	HBT vs group care	RCT	13	mixed	7
Henggeler et al. (2002)	North America	HBT vs group care	RCT	12,9	mixed	6
James, Roesch, & Zhang (2012)	North America	HBT vs group care	Matched control	8,10	mixed	5
Henggeler, Milton, & Smith (1992)	North America	HBT vs group care	RCT	15,2	mixed	4
Leve, Chamberlain, & Reid (2005)	North America	TFCO-A vs group care	RCT	15,3	female	3
Liddle et al. (2018)	North America	HBT vs group care	RCT	15,4	mixed	20
Mattejat, Hirt, Wilken, Schmidt, & Remschmidt (2001)	Western Europe	HBT vs group care	RCT	11,9	mixed	4
McCrae, Lee, Barth, & Rauktis (2010)	North America	TFCO-A vs group care	Matched control	11,1	mixed	5
Portwood et al. (2018)	North America	TFCO-A vs group care	Non-matched	13,81	mixed	8
Poultan et al. (2014)	North America	TFCO-A vs group care	RCT	15,31	female	4
Preyde et al. (2011a)	North America	HBT vs group care	Matched control	13,9	mixed	20
Preyde et al. (2011b)	North America	HBT vs group care	Non-matched	13,9	mixed	8
Preyde, Adams, Cameron, & Frensch (2009)	North America	HBT vs group care	Non-matched	11,57	mixed	13
Robst, Armstrong, & Dollard (2011)	North America	TFCO-A vs group care	Matched control	–	mixed	2
Robst, Armstrong, Dollard, & Rohrer (2013)	North America	TFCO-A vs group care	Matched control	13,08	mixed	6
Ryan, Marshall, Herz, & Hernandez (2007)	North America	TFCO-A vs group care	Matched control	7–16	mixed	1
Wilmshurst (2002)	North America	HBT vs group care	RCT	10,67	mixed	8

Appendix B. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chilcyouth.2020.104950>.

References

References marked with an asterisk (*) are included in the meta-analysis.

- Ainsworth, F. (2017). For the few not the many: An Australian perspective on the use of therapeutic residential care for children and young people. *Residential Treatment for Children & Youth*, 34, 325–338. <https://doi.org/10.1080/0886571X.2017.1383868>.
- Armijo-Olivo, S., Stiles, C. R., Hagen, N. A., Biondo, P. D., & Cummings, G. G. (2012). Assessment of study quality for systematic reviews: A comparison of the Cochrane collaboration risk of bias tool and the effective public health practice project quality assessment tool. *Journal of Evaluation in Clinical Practice*, 18, 12–18. <https://doi.org/10.1111/j.1365-2753.2010.01516.x>.
- Asscher, J. J., Van Vugt, E. S., Stams, G. J. J. M., Deković, M., Eichelsheim, V. I., & Yousefi, S. (2011). The relationship between juvenile psychopathic traits, delinquency and (violent) recidivism: A meta-analysis. *Journal of Child Psychology and Psychiatry*, 52, 1134–1143. <https://doi.org/10.1111/j.1469-7610.2011.02412.x>.
- Assink, M., Spruit, A., Schuts, M., Lindauer, R., Van der Put, C., & Stams, G. J. J. M. (2018). The intergenerational transmission of child maltreatment: A three level meta-analysis. *Child Abuse & Neglect*, 84, 131–145. <https://doi.org/10.1016/j.chiabu.2018.07.037>.
- Assink, M., & Wibbelink, C. J. M. (2016). Fitting three-level meta-analytic models in R: A step-by-step tutorial. *The Quantitative Methods for Psychology*, 12, 154–174. <https://doi.org/10.20982/tqmp.12.3.p154>.
- Åström, T., Bergström, M., Håkansson, K., Jonsson, A. K., Munthe, C., Wirtberg, I., ... Sundell, K. (2019). Treatment foster care oregon for delinquent adolescents: A systematic review and meta-analysis. *Research of Social Work Practice*, 1–13. <https://doi.org/10.1177/1049731519890394>.
- Attar-Schwartz, S. (2009). School functioning of children in residential care: The contributions of multilevel correlates. *Child Abuse and Neglect*, 33, 429–440. <https://doi.org/10.1016/j.chiabu.2008.12.010>.
- Baker, A. J. L., Archer, M., & Curtis, P. A. (2005). Age and gender differences in emotional and behavioural problems during the transition to residential treatment: The Odyssey Project. *International Journal of Social Welfare*, 14, 184–194. <https://doi.org/10.1111/j.1468-2397.2005.00358.x>.
- *Barth, R. P., Greens, J. K. P., Guo, S., Green, R. L., Hurley, S., & Sisson, J. (2007). Outcomes for youth receiving intensive in-home therapy or residential care: A comparison using propensity scores. *American Journal of Orthopsychiatry*, 77, 497–505. <https://doi.org/10.1037/0002-9432.77.4.497>.
- *Bergström, M., & Højman, L. (2016). Is multidimensional treatment foster care (MTFC) more effective than treatment as usual in a three year follow-up? Results from MTFC in a Swedish setting. *European Journal of Social Work*, 19, 219–235. <https://doi.org/10.1080/13691457.2015.1030361>.
- Broeders, R., Van der Helm, G. H. P., & Stams, G. J. J. M. (2015). Preventie van gesloten plaatsing van jongeren met ernstige gedragsproblemen in Friesland: Een pleidooi voor een gerichte aanpak [Prevention of residential placement of adolescents with severe behavior problems Friesland, a province of The Netherlands: A plea for a targeted approach]. *Orthopedagogiek: Onderzoek en Praktijk*, 54, 318–330.
- Bruning, M. R., & Jong-de Kruijf, M. P. (2015). From youth services to youth help: The new arrangement considered further. *Journal of Family- and Juvenile Law*, 33, 134–143.
- Busschers, I., & Konijn, C. (2019). Inzet van spoedplaatsingen in JeugdzorgPlus: Het hoe, wat en waarom van het aanvragen van een gesloten spoedplaatsing voor een jongere door gezinsmanagers van Jeugdbescherming Regio Amsterdam [Emergency placement in residential youth care: The how, what and why of emergency residential care placements of adolescents by family managers of the Youth Protection Agency Amsterdam] (Report). Retrieved from https://www.projuventute-amsterdam.nl/fileupload/SpoedplaatsingeninJeugdzorgPlus_JeugdbeschermingenDeKoppeling_2019.pdf.
- *Cameron, G., Frensch, K., Preyde, M., & Smit Quosai, T. (2011). Community adaptation of youth accessing residential programs or a home-based alternative: Contact with the law and delinquent activities. *Residential Treatment for Children & Youth*, 28, 150–175. <https://doi.org/10.1080/0886571X.2011.577344>.
- *Chamberlain, P., Leve, L. D., & DeGarmo, D. S. (2007). Multidimensional treatment foster care for girls in the juvenile justice system: 2-year follow-up of a randomized clinical trial. *Journal of Consulting and Clinical Psychology*, 75, 187–193. <https://doi.org/10.1037/0022-006X.75.1.187>.
- *Chamberlain, P., & Reid, J. B. (1998). Comparison of two community alternatives to incarceration for chronic juvenile offenders. *Journal of Consulting and Clinical Psychology*, 4, 624–633. <https://doi.org/10.1037/0022-006X.66.4.624>.
- De Swart, J. J. W., Van den Broek, H., Stams, G. J. J. M., Asscher, J. J., Van der Laan, P. H., Holsbrink-Engels, G. A., & Van der Helm, G. H. P. (2012). The effectiveness of institutional youth care over the past three decades: A meta-analysis. *Children and Youth Services Review*, 34, 1818–1824. <https://doi.org/10.1016/j.chilcyouth.2012.05.015>.
- De Valk, S., Kuiper, C., Van der Helm, G. H. P., Maas, A. J. J. A., & Stams, G. J. J. M. (2016). Repression in residential youth care: A scoping review. *Adolescent Research Review*, 1, 195–216. <https://doi.org/10.1007/s40894-016-0029-9>.
- Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm: Peer groups and problem behavior. *American Psychologist*, 54, 755–764. <https://doi.org/10.1037/0003-066X.54.9.755>.
- Dishion, T. J., Poulin, F., & Burraston, B. (2001). Peer group dynamics associated with iatrogenic effects in group interventions with high-risk young adolescents. *New Directions for Child and Adolescent Development*, 91, 79–92. <https://doi.org/10.1002/cd.6>.
- Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*, 56, 455–463. <https://doi.org/10.1111/j.0006-341X.2000.00455.x>.

- *Eddy, J. M., Whaley, R. B., & Chamberlain, P. (2004). The prevention of violent behavior by chronic and serious male juvenile offenders: A 2-year follow-up of a randomized clinical trial. *Journal of Emotional and Behavioral Disorders*, 12, 2–8. <https://doi.org/10.1177/10634266040120010101>.
- Eltink, E. M. A., Roest, J. J., Van der Helm, G. H. P., Kuiper, C. H. Z., Nijhof, K. S., Vandevelde, S., . . . Harder, A.T. (2019). Safety first! Residential group climate and antisocial behavior: A multilevel meta-analysis. Manuscript submitted for publication.
- Eltink, E. M. A., Ten Hoeve, J., De Jongh, T., Van der Helm, G. H. P., Wissink, I. B., & Stams, G. J. J. M. (2017). Stability and change of adolescents' aggressive behavior in residential youth care. *Child & Youth Care Forum*, 47, 199–217. <https://doi.org/10.1007/s10566-017-9425-y>.
- Fisher, P. A., & Chamberlain, P. (2000). Multidimensional treatment foster care: A program for intensive parenting, family support, and skill building. *Journal of Emotional and Behavioral Disorders*, 8, 155–164. <https://doi.org/10.1177/10634266000800303>.
- Frensch, K. M., & Cameron, G. (2002). Treatment of choice or a last resort? A review of residential mental health placements for children and youth. *Child & Youth Care Forum*, 31, 307–339. <https://doi.org/10.1023/A:1016826627406>.
- Goense, P. B., Assink, M., Stams, G. J. J. M., Boendermaker, L., & Hoeve, M. (2016). Making 'what works' work: A meta-analytic study of the effect of treatment integrity on outcomes of evidence-based interventions for juveniles with antisocial behavior. *Aggression and Violent Behavior*, 31, 106–115. <https://doi.org/10.1016/j.avb.2016.08.003>.
- Harder, A. T. (2011). The downside up? A study of factors associated with a successful course of treatment for adolescents in secure residential care (proefschrift).
- *Harold, G. T., Kerr, D. C. R., van Ryzin, M., DeGarmo, D. S., Rhoades, K. A., & Leve, L. D. (2013). Depressive symptom trajectories among girls in the juvenile justice system: 24-month outcomes of an RCT of multidimensional treatment foster care. *Prevention Science*, 14, 437–446. <https://doi.org/10.1007/s11121-012-0317-y>.
- Hartnett, D., Carr, A., Hamilton, E., & O'Reilly, G. (2017). The effectiveness of functional family therapy for adolescent behavioral and substance misuse problems: A meta-analysis. *Family Process*, 56, 607–619. <https://doi.org/10.1111/famp.12256>.
- Henggeler, S. W. (2011). Efficacy studies to large-scale transport: The development and validation of multisystemic therapy programs. *Annual Review of Clinical Psychology*, 7, 351–381. <https://doi.org/10.1146/annurev-clinpsy-032210-104615>.
- *Henggeler, S. W., Melton, G. B., & Smith, L. A. (1992). Family preservation using multisystemic therapy: An effective alternative to incarcerating serious juvenile offenders. *Journal of Consulting and Clinical Psychology*, 60, 953–961. <https://doi.org/10.1037/0022-006X.60.6.953>.
- *Henggeler, S. W., Rowland, M. D., Halliday-Boykins, C., Sheidow, A. J., Ward, D. M., Randall, J., . . . Edwards, J. (2002). One-year follow-up of multisystemic therapy as an alternative to the hospitalization of youths in psychiatric crisis. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 543–551. <https://doi.org/10.1097/01.CHI.0000046834.09750.5F>.
- *Henggeler, S. W., Rowland, M. D., Randall, J., Ward, D. M., Pickrel, S. G., Cunningham, P. B., . . . Santos, A. B. (1999). Home-based multisystemic therapy as an alternative to the hospitalization of youths in psychiatric crisis: Clinical outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1331–1339. <https://doi.org/10.1097/00004583-199911000-00006>.
- Herman, J. (1997). *Trauma and recovery*. New York: Basic Books.
- Hoogsteder, L., Stams, G. J. J. M., Schippers, E. E., & Bonnes, D. (2018). Responsive Aggression Regulation Therapy (Re-ART): An evaluation study in a dutch juvenile justice institution in terms of recidivism. *International Journal of Offender Therapy and Comparative Criminology*, 62, 4403–4424. <https://doi.org/10.1177/0306624X18761267>.
- Huefner, J. C., Handwerker, M. L., Ringle, J. L., & Field, C. E. (2009). Conduct disordered youth in group care: An examination of negative peer influence. *Journal of Child and Family Studies*, 18, 719–730. <https://doi.org/10.1007/s10826-009-9278-6>.
- Huefner, J. C., & Ringle, J. L. (2012). Examination of negative peer contagion in a residential care setting. *Journal of Child and Family Studies*, 21, 807–815. <https://doi.org/10.1007/s10826-011-9540-6>.
- James, S. (2017). Implementing evidence-based practice in residential care: How far have we come? *Residential Treatment for Children & Youth*, 34, 155–175. <https://doi.org/10.1080/0886571X.2017.1332330>.
- *James, S., Roesch, S., & Zhang, J. J. (2012). Characteristics and behavioral outcomes for youth in group care and family-based care: A propensity score matching approach using national data. *Journal of Emotional and Behavioral Disorders*, 20, 144–156. <https://doi.org/10.1177/1063426611409041>.
- Knorth, E. J., Harder, A. T., Zandberg, T., & Kendrick, A. J. (2007). Under one roof: A review and selective meta-analysis on the outcomes of residential child and youth care. *Children and Youth Services Review*, 30, 123–140. <https://doi.org/10.1016/j.childyouth.2007.09.001>.
- Konijn, C., Admiraal, S., Baart, J., Van Rooij, F., Stams, G. J. J. M., Colonessi, C., . . . Assink, M. (2019). Foster care placement instability: A meta-analytic review. *Children and Youth Review*, 96, 483–499. <https://doi.org/10.1016/j.childyouth.2018.12.002>.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement in categorical data. *Biometrics*, 33, 159–174. <https://doi.org/10.2307/2529310>.
- Lee, B. R., & Thompson, R. (2009). Examining externalizing behavior trajectories of youth in group homes: Is there evidence for peer contagion? *Journal of Abnormal Child Psychology*, 37, 31–44. <https://doi.org/10.1007/s10802-008-9254-4>.
- Leloux-Opmeer, H., Kuiper, C. H. Z., Swaab, H. T., & Scholte, E. M. (2017). Children referred to foster care, family-style group care, and residential care: (How) do they differ? *Children and Youth Services Review*, 77, 1–9. <https://doi.org/10.1016/j.childyouth.2017.03.018>.
- *Leve, L. D., Chamberlain, P., & Reid, J. B. (2005). Intervention outcomes for girls referred from juvenile justice: Effects and delinquency. *Journal of Consulting and Clinical Psychology*, 6, 1181–1185. <https://doi.org/10.1037/0022-006X.73.6.1181>.
- *Liddle, H. A., Dakof, G. A., Rowe, C. L., Henderson, C., Greenbaum, P., Wang, W., & Alberga, L. (2018). Multidimensional family therapy as a community-based alternative to residential treatment for adolescents with substance use and co-occurring mental health disorders. *Journal of Substance Abuse Treatment*, 90, 47–56. <https://doi.org/10.1016/j.jsat.2018.04.011>.
- Little, J. H., Popa, M., & Forsythe, B. (2005). Multisystemic therapy for social, emotional, and behavioral problems in youth aged 10–17 (Review). *The Cochrane Database of Systematic Reviews*, 4. <https://doi.org/10.1002/14651858.CD004797.pub4>.
- Martín, E., González- García, C., Del Valle, J. F., & Bravo, A. (2018). Therapeutic residential care in Spain. Population treated and therapeutic coverage. *Child & Family Social Work*, 23, 1–7. <https://doi.org/10.1111/cfs.12374>.
- *Mattejat, F., Hirt, B. R., Wilken, J., Schmidt, M. H., & Renschmidt, H. (2001). Efficacy of inpatient and home treatment in psychiatrically disturbed children and adolescents: Follow-up assessment of the results of a controlled treatment study. *European Child & Adolescent Psychiatry*, 10, 71–79. <https://doi.org/10.1007/s007870170008>.
- McCartney, K., & Rosenthal, R. (2000). Effect size, practical importance, and social policy for children. *Child Development*, 71, 173–180. <https://doi.org/10.1111/1467-8624.00131>.
- *McCrae, J. S., Lee, B. R., Barth, R. P., & Rautkis, M. E. (2010). Comparing three years of well-being outcomes for youth in group care and nonkinship foster care. *Child Welfare*, 89, 229–249.
- Moffett, S., Brotnow, L., Patel, A., Adnopolz, J., & Woolstone, J. (2017). Intensive home-based programs for youth with serious emotional disturbances: A comprehensive review of experimental findings. *Children and Youth Services Review*, 85, 319–325. <https://doi.org/10.1016/j.childyouth.2017.10.004>.
- *Portwood, S. G., Boyd, S. A., Nelson, E. B., Murdock, T. B., Hamilton, J., & Miller, A. D. (2018). A comparison of outcome for children and youth in foster and residential group care across agencies. *Children and Youth Services Review*, 85, 19–25. <https://doi.org/10.1016/j.childyouth.2017.11.027>.
- *Poulton, R., van Ryzin, M. J., Harold, G. T., Chamberlain, P., Fowler, D., Cannon, M., Arsenault, L., & Leve, L. D. (2014). Effects of Multidimensional treatment foster care on psychotic symptoms in Girls. *Journal of the American Academy of Child & Adolescent Psychiatry*, 53, 1279–1287. <https://doi.org/10.1016/j.jaac.2014.08.014>.
- *Preyde, M., Adams, G., Cameron, G., & Frensch, K. (2009). Outcomes of children participating in mental health residential and intensive family services: Preliminary findings. *Residential Treatment for Children & Youth*, 26, 1–20. <https://doi.org/10.1080/08865710802689555>.
- *Preyde, M., Frensch, K., Cameron, G., Hazineh, L., & Riosa, P. B. (2011a). Mental health outcomes of children and youth accessing residential programs or a homebased alternative. *Social Work in Mental Health*, 9, 1–21. <https://doi.org/10.1080/15332985.2010.494557>.
- *Preyde, M., Frensch, K., Cameron, G., White, S., Penny, R., & Lazure, K. (2011b). Long-term outcomes of children and youth accessing residential or intensive home-based treatment: Three year follow up. *Journal of Child and Family Studies*, 20, 660–668. <https://doi.org/10.1007/s10826-010-9442-z>.
- Raposa, E. B., Rhodes, J., Stams, G. J., Card, N., Burton, S., Schwartz, S., . . . Hussain, S. (in press). The effects of youth mentoring programs: A meta-analysis of outcome studies. *Journal of Youth and Adolescence*.
- Rice, M. E., & Harris, G. T. (2005). Comparing effect sizes in follow-up studies: ROC area, Cohen's d, and r. *Law and Human Behavior*, 29, 615–620. <https://doi.org/10.1007/s10979-005-6832-7>.
- Robbins, M. S., Alexander, J. F., Turner, C. W., & Hollimon, A. (2016). Evolution of functional family therapy as an evidence-based practice for adolescents with disruptive behavior problems. *Family Process*, 55, 543–557. <https://doi.org/10.1111/famp.12230>.
- Robst, J., Armstrong, M., & Dollard, N. (2011). Comparing outcomes for youth served in treatment foster care and treatment group care. *Journal for Child and Family Studies*, 20, 696–705. <https://doi.org/10.1007/s10826-011-9447-2>.
- *Robst, J., Armstrong, M., Dollard, N., & Rohrer, L. (2013). Arrests among youth after out-of-home mental health treatment: Comparisons across community and residential treatment settings. *Criminal Behavior and Mental Health*, 23, 162–176. <https://doi.org/10.1002/cbm.1871>.
- Rosenthal, R., & Hershstein, R. J. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin*, 86, 638–641. <https://doi.org/10.1037/0033-2909.86.3.638>.
- *Ryan, J. P., Marshall, J. M., Herz, D., & Hernandez, P. M. (2007). Juvenile delinquency in child welfare: Investigating group home effects. *Children and Youth Services Review*, 30, 1088–1099. <https://doi.org/10.1016/j.childyouth.2008.02.004>.
- Sánchez-Meca, J., & Marín-Martínez, F. (2008). Confidence intervals for the overall effect size in random-effects meta-analysis. *Psychological Methods*, 13, 31–48. <https://doi.org/10.1037/1082-989X.13.1.31>.
- Sawyer, A. M., Borduin, C. M., & Dopp, A. R. (2015). Long-term effects of prevention and treatment on youth antisocial behavior: A meta-analysis. *Clinical Psychology Review*, 42, 130–144. <https://doi.org/10.1016/j.cpr.2015.06.009>.
- Sinclair, I., Parry, E., Biehal, N., Fresen, J., Kay, C., Scott, S., & Green, J. (2016). Multidimensional treatment foster care in England: Differential effects by level of initial antisocial behavior. *European Child & Adolescent Psychiatry*, 25, 843–852. <https://doi.org/10.1007/s00787-015-0799-9>.
- Souverein, F. A., Van der Helm, G. H. P., & Stams, G. J. J. M. (2013). Nothing works in secure residential care? *Children and Youth Services Review*, 35, 1941–1945. <https://doi.org/10.1016/j.childyouth.2013.09.010>.
- Stams, G. J. J. M., & Van der Helm, G. H. P. (2017). What works in residential programs for aggressive and violent youth? Treating youth at risk for aggressive and violent behavior in (secure) residential care. In P. Sturmey (Ed.). *The Wiley Handbook of*

- Violence and Aggression*. Hoboken, NJ: Wiley-Blackwell.
- Strijbosch, E. L. L., Huijs, J. A. M., Stams, G. J. J. M., Wissink, I. B., Van der Helm, G. H. P., De Swart, J. J. W., & Van der Veen, Z. (2015). The outcome of institutional youth care compared to non-institutional youth care for children of primary school age and early adolescence: A multi-level meta-analysis. *Children and Youth Services Review*, *58*, 208–218. <https://doi.org/10.1016/j.childyouth.2015.09.018>.
- Suter, J. C., & Bruns, E. J. (2009). Effectiveness of the wraparound process for children with emotional and behavioral disorders: A meta-analysis. *Clinical Child and Family Psychology Review*, *12*, 336–351. <https://doi.org/10.1007/s10567-009-0059-y>.
- The California Evidence-based Clearinghouse. (2018). Treatment Foster Care Oregon – Adolescents (TFCO-A). Retrieved from <https://www.cebc4cw.org/program/treatment-foster-care-oregon-adolescents/>. Last visited on March 3th 2020.
- Thompson, B. (2007). Effect sizes, confidence intervals, and confidence intervals for effect sizes. *Psychology in the school*, *44*, 423–432. <https://doi.org/10.1002/pits.20234>.
- Van Dam, L., Neels, S., De Winter, M., Branje, S., Wijsbroek, S., Hutschemaekers, G., ... Stams, G. J. J. M. (2017). Youth initiated mentors: Do they offer an alternative for out-of-home placement in youth care? *British Journal of Social Work*, *47*, 1746–1780. <https://doi.org/10.1093/bjsw/bcx092>.
- Van Dam, L., Smit, D., Wildschut, B., Branje, S. J. T., Rhodes, J. E., Assink, M., & Stams, G. J. J. M. (2018). Does natural mentoring matter? A multilevel meta-analysis on the association between natural mentoring and youth outcomes. *American Journal of Community Psychology*, *62*, 203–220. <https://doi.org/10.1002/ajcp.12248>.
- Van den Bergh, P. M., Weterings, A. M., & Schoenmakers, M. (2011). Gehechtheid en loyaliteit bij pleegkinderen. Een analyse vanuit de theorie en de praktijk [Attachment and loyalty in foster children. An analysis from theory and practice]. *Tijdschrift voor Orthopedagogiek. Kinderpsychiatrie en Klinische Kinderpsychologie*, *36*, 128–143.
- Van den Noortgate, W., López-López, J. A., Marín-Martínez, F., & Sánchez-Meca, J. (2013). Three-level meta-analysis of dependent effect sizes. *Behavior Research Methods*, *45*, 576–594. <https://doi.org/10.3758/s13428-012-0261-6>.
- Van der Helm, G. H. P., & Hanrath, J. (Eds.). (2011). *Wat werkt in de gesloten jeugdzorg? What works in secure residential care?*. Amsterdam: Uitgeverij SWP.
- Van der Helm, G. H. P., Kuiper, C. H. Z., & Stams, G. J. J. M. (2018). Group climate and treatment motivation in secure residential and forensic youth care from the perspective of self-determination theory. *Children and Youth Services Review*, *93*, 339–344. <https://doi.org/10.1016/j.childyouth.2018.07.028>.
- Van der Pol, T. M., Van Domburgh, L., Van Widenfelt, B. M., Hurlburt, M. S., Garland, A. F., & Vermeiren, R. R. J. M. (2019). Common elements of evidence-based systemic treatments for adolescents with disruptive behaviour problems. *Lancet Psychiatry*, *6*, 862–868. [https://doi.org/10.1016/S2215-0366\(19\)30085-9](https://doi.org/10.1016/S2215-0366(19)30085-9).
- Van der Pol, T. M., Hoeve, M., Noom, M. J., Stams, G. J. J. M., Doreleijers, T. A. H., Van Domburgh, L., & Vermeiren, R. R. J. M. (2017). Research review: The effectiveness of multidimensional family therapy in treating adolescents with multiple behavior problems – a meta-analysis. *Journal of Child Psychology and Psychiatry*, *58*, 532–545.
- Van der Stouwe, T., Asscher, J. J., Stams, G. J. J. M., Deković, M., & Van der Laan, P. H. (2014). The effectiveness of multisystemic therapy (MST): A meta-analysis. *Clinical Psychology Review*, *34*, 468–481. <https://doi.org/10.1016/j.cpr.2014.06.006>.
- Van Stam, M. A., Van der Schuur, W. A., Tserkezis, S., Van Vugt, E. S., Asscher, J. J., Gibbs, J. C., & Stams, G. J. J. M. (2014). The effectiveness of Equip on sociomoral development and recidivism reduction: A meta-analytic study. *Children and youth services review*, *38*, 260–275. <https://doi.org/10.1016/j.childyouth.2014.01.002>.
- Viechtbauer, W. (2017). Conducting meta-analyses in R with the metaphor package. *Journal of Statistical Software*, *36*, 1–48.
- Weiss, B., Caron, A., Ball, S., Tapp, J., Johnson, M., & Weisz, J. R. (2005). Iatrogenic effects of group treatment for antisocial youth. *Journal of Consulting and Clinical Psychology*, *73*, 1036–1044. <https://doi.org/10.1037/0022-006X.73.6.1036>.
- Weisz, J. R., Kuppens, S., Ng, M. Y., Eckshtain, D., Ugueto, A. M., Vaughn-Coaxum, R., ... Fordwood, S. R. (2017). What five decades of research tells us about the effects of youth psychological therapy: A multilevel meta-analysis and implications for science and practice. *American Psychologist*, *72*, 79–117. <https://doi.org/10.1037/a0040360>.
- Westermarck, P. K., Hansson, K., & Olsson, M. (2011). Multidimensional treatment foster care (MTFC): Results from an independent replication. *Journal of Family Therapy*, *33*, 20–41. <https://doi.org/10.1111/j.1467-6427.2010.00515.x>.
- Whittaker, J. K., Del Valle, J. F., & Holmes, L. (Eds.). (2015). *Therapeutic residential care with children and youth: Developing evidence-based international practice*. London/Philadelphia: Jessica Kingsley Publishers.
- Whittaker, J. K., Holmes, L., Del Valle, J. F., Ainsworth, F., Andreassen, T., Anglin, J. P., ... Zeira, A. (2016). Therapeutic residential care for children and youth: A consensus statement of the international work group on therapeutic residential care. *Residential Treatment for Children & Youth*, *33*, 89–106. <https://doi.org/10.1080/0886571X.2016.1215755>.
- Wibbelink, C. J. M., Hoeve, M., Stams, G. J. J. M., & Oort, F. J. (2017). A meta-analysis of the association between mental disorders and juvenile recidivism. *Aggression and Violent Behavior*, *33*, 78–90. <https://doi.org/10.1016/j.avb.2017.01.005>.
- *Wilmshurts, L. A. (2002). Treatment programs for youth with emotional and behavioral disorders: An outcome study of two alternate approaches. *Mental Health Services Research*, *4*, 85–96. <https://doi.org/10.1023/A:1015200200316>.
- Wilson, D. B. (2001). Practical meta-analysis effect size calculator. Retrieved from <https://www.campbellcollaboration.org/escalc/html/EffectSizeCalculator-Home.php>. Last visited on October 5th 2018.
- Zahn, M. A., Day, J. C., Mihalic, S. F., & Tichavsky, L. (2009). Determining what works for girls in the juvenile justice system: A summary of evaluation evidence. *Crime & Delinquency*, *55*, 266–293. <https://doi.org/10.1177/0011128708330649>.