



Raymond Gutterswijk

Does it suit you?

Tailor-made treatment for adolescent boys and girls in secure residential care

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Does It Suit You?

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Chapter 1

GENERAL INTRODUCTION

Secure residential youth care

Secure residential youth care (SRC) facilities provide help to youth who suffer from serious behavioral problems and/or adverse family circumstances. These youth need intensive and sometimes restrictive help because their safety is at risk, they pose a risk to their surroundings and/or they withdraw themselves from care (Attar-Schwartz, 2009; Eltink et al., 2017; Frensch & Cameron, 2002; Leloux-Opmeer et al., 2017; Martin et al., 2017). In most cases, less restrictive types of care (e.g., foster care or outpatient care) have been provided in the past but have not succeeded in diminishing the risks and problems that threaten the psychosocial development and safety of the adolescents (Bhatti-Sinclair & Sutcliffe, 2012; Pinto & Maia, 2013). Consequently, the Dutch equivalent of the Youth Protection Council [Raad voor de Kinderbescherming] requests a judge for permission to place adolescents out-of-home into 24-hour SRC facilities, a measure which is mostly seen as a last resort, when less restrictive type of care failed to reduce the developmental risks of the youth. SRC facilities use the daily living environment as a therapeutic setting. Youth care institutions add more specialized services, for example trauma therapy, when indicated (Whittaker et al., 2015).

In the Netherlands, SRC is subject to the Child and Youth Act [Jeugdwet], dating from 2015. The main goals of this act are: (1) strengthening the problem-solving capacity of children and young people, their parents and social environment, (2) promoting parenting capacities of parents and the social environment, (3) prevention and early detection, (4) providing the right tailor-made help in a timely manner, and (5) effective and efficient collaboration with families. Although several meta-analyses showed that (secure) residential care can be modestly effective in reducing youth behavioral problems (De Swart et al., 2012; Strijbosch et al., 2015) critics have raised questions about the appropriateness of residential care to achieve the aforementioned goals in recent years (Whittaker et al., 2016).

Critics state that secure residential youth care substantially restricts autonomy of children and adolescents and limits contact with family and friends (James, 2017; Knorth et al., 2007). SRC may even cause iatrogenic effects when adolescents experience repression in the institution or are negatively influenced by their peers (De Valk et al., 2016; Dishion, McCord, & Poulin, 1999). To counter this criticism, youth care organizations around the world aim to increase the effectiveness of SRC by tailoring the treatment to the individual adolescents (e.g., providing trauma-sensitive and gender-specific care). Even though the characteristics of adolescents in residential youth care vary widely, facilities rely heavily on standardized group care programs as a cure for all problems (Libbey et al., 2005). These standardized programs are usually based on knowledge about treatment for boys, as they were the majority in intensive youth care for years. In recent years however, the share of girls in institutional youth care has increased, at least in The Netherlands, which calls for more knowledge of treatment for girls in intensive youth care (Nijhof & Engels, 2015). Youth care organizations respond to this shift in the target population by offering treatment in female-specific facilities. However, the evidence to support this approach is limited. Previous studies did not sufficiently investigate the similarities and differences between boys and girls in SRC regarding the presence and seriousness of problems and risk factors. Neither is it clear whether well known risk factors for behavioral problems in the general population are related to problem behavior of adolescents in SRC as well, nor whether risk factors for behavioral problems differ for boys and girls. Moreover, the added value of offering female-specific SRC to adolescent girls is unknown, since its effectiveness has not yet been studied.

Furthermore, youth care organizations offer other, already existing, interventions to adolescents who are currently dependent on SRC (e.g., Functional Family Therapy, Alexander et al., 2013; Multisystemic Therapy, Henggeler, 2001; Therapeutic Foster Care, Hahn et al., 2005; Treatment Foster Care Oregon for Adolescents, Chamberlain, 2003). In some cases,

organizations offer these interventions as an alternative to SRC, and in other cases in addition to the treatment in SRC. These interventions try to increase the effectiveness of youth care by helping to realize tailor-made care; treatment that is tailored to the specific risks and needs of the individual adolescents. However, there is a lack of knowledge as to whether these interventions are of added value or a sufficient alternative to SRC.

Characteristics of boys and girls in secure residential youth care

Behavioral problems. Over 90% of adolescents in SRC suffer from externalizing behavioral problems at admission and approximately 50% to 55% suffer from internalizing behavioral problems (Harder et al., 2015; Nijhof et al., 2018). Behavioral problems pose a long-term risk because adolescents' school careers are often interrupted and characterized by difficult relationships with teachers and other students, and often result in not completing an education, working below competence level or becoming unemployed (Matthys & Van West, 2014; Maughan & Rutter, 2001). Adolescents with behavioral problems are also more likely to encounter delinquent peers (Utrzan et al., 2018), show delinquent behavior and use drugs (Maughan & Rutter, 2001). These adolescents more often display risky behavior, including sexually transgressive behavior (Lindauer, 2014). Some adolescents with serious behavioral problems develop anxiety problems or become depressed later in life (Burke et al., 2018). Since these problems pose a great risk to the healthy development of these adolescents, it is important that youth care can effectively diminish these problems. To do so, the care should focus on dynamic risk factors, factors that can be influenced by treatment, to diminish the risks that cause these problems (Lipsey & Derzon, 1998).

Risk factors. Previous SRC target group descriptions showed that traumatic experiences (Dirkse et al., 2018; Vermaes et al., 2012), low perceived competence (Harder et al., 2015), and problems within the family (Nijhof, 2011; Van Dam et al., 2010) occur frequently within the population. In addition, these characteristics correlate with problem behavior (Dirkse et al.,

2018; Harder et al., 2015; Harder et al., 2018; Nijhof et al., 2012; Van Aggelen et al., 2009; Van Dam et al., 2010; Vermaes et al., 2012) and can be regarded as important risk factors for behavioral problems. Finally, we know that trauma related problems, low perceived competence and problems within the family can be susceptible to treatment and can therefore form the basis for the treatment approach in SRC (Lenz & Hollenbaugh, 2015; Morton & Montgomery, 2013; Rodenburg et al., 2009; Stouwe et al., 2014; Wiggings et al., 2009). However, the existing evidence on the presence and seriousness of risk factors in boys and girls in SRC shows mixed findings and is inconclusive (Dirkse et al., 2018; Handwerk et al., 2006; Harder et al., 2015; Holtberg et al., 2016; Nijhof et al., 2011; Nijhof et al., 2012; Singer et al., 2000). This knowledge is necessary for youth care organizations to be able to tailor their treatment to the risks and needs of the adolescents in care and can provide a scientific basis for whether or not to offer gender-specific help.

Theoretical framework for treatment in SRC

To provide effective treatment to adolescents who are referred to SRC because of their severe behavioral problems, trauma problems and/or problems within the family, we consider two frameworks most relevant: the Self-determination theory and the Risk-Needs-Responsivity model.

Self-determination theory

The Self-determination theory (SDT; Deci & Ryan, 2008) is a macro-theory on human motivation. According to SDT, for effective functioning and psychological health there is a set of psychological needs that must be satisfied: the needs for competence, autonomy, and relatedness. The importance to satisfy these needs appears to be universal and overall satisfaction predicts psychological well-being (Deci & Ryan, 2008). Adolescents in general are at risk of becoming frustrated regarding these needs, because they are going through a transition

from childhood into adulthood. This transition goes hand in hand with changes in cognitive, social, and emotional functioning (Lerner & Steinberg, 2009). Adolescents have a strong need to feel independent, but sometimes they lack the skills to do so (also known as the ‘maturity gap’). This maturity gap can make adolescents vulnerable to both internalizing and externalizing problem behavior (Cicchetti & Rogosch, 2002; Zahn-Waxler et al., 2000). During adolescence social relationships, especially with peers, become more important. At the same time, the importance of the relationship with parents decreases (Herba & Philips, 2004). To treat adolescents effectively, treatment should be supportive of satisfying their basic psychological needs (Van der Helm et al., 2018). To match the need for relatedness treatment should be offered in a responsive way to the adolescent. To accommodate the need for autonomy, care professionals should demonstrate an empathic and accepting attitude towards the adolescent and take the adolescent’s perspective. Lastly, to support the feeling of competence, care professionals should provide treatment in a structured way (Deci & Ryan, 2008; Soenens et al., 2017).

Risk, needs, responsivity principles

The Risk-Needs-Responsivity model (RNR; Bonta & Andrews, 2007) describes the way in which treatment for persons who display antisocial behavior should be organized to be as effective as possible and consists of three basic assumptions or principles. The first principle holds that the intensity of treatment should be based on the risk of antisocial behavior: adolescents with the greatest risk should receive the most intensive treatment. The second component comprises the so-called ‘criminogenic needs’ of the adolescent, i.e., the risk factors that lead to problematic behavior. By focusing treatment on these needs, adjustment of problematic behavior can be achieved. The third assumption of responsiveness is that the success of treatment depends on customization of treatment to specific client characteristics. The help must fit the learning style of the adolescent, his or her motivation, possibilities, and

abilities. In line with this model, SRC should focus on dynamic risk factors that can be influenced by treatment to diminish the risks that threaten the adolescent's psychosocial development and risk of relapse (Lipsey & Derzon, 1998). Consequently, identifying the characteristics of the adolescents is essential to develop tailored care and a decision model supporting referral.

Taking the RNR model into account, care professionals should treat adolescents with similar patterns of risk factors in a comparable way and should treat adolescents that show different patterns of risk factors at admission differently. Comparing the risks and needs that are related to behavioral problems of boys and girls in SRC has the potential to inform whether boys and girls can be treated in a similar way or need gender-specific care. Furthermore, comparing the change of girls' problems during treatment in regular SRC to the change girls in gender-specific care experience (e.g., where trauma-sensitive treatment is provided) reveals information about whether a female-specific treatment causes higher effectiveness and is therefore justified.

Effectiveness of secure residential youth care

Studies on the effectiveness of SRC report inconsistent findings. In their recent study on both open and secure residential youth care, Gevers et al. (2021) found that the largest proportion of adolescents failed to improve in both their externalizing and internalizing behavioral problems, regardless of the informant (i.e., self-reports, group care worker reports and parent reports). Furthermore, up to 27% of adolescents showed deterioration in their externalizing problems and up to 20% of adolescents in their internalizing problems. However, improvement was found in up to a third of adolescents regarding their externalizing problems and in up to a fourth of adolescents regarding their internalizing problems. Eltink et al. (2017) showed with their study on boys and girls in open, semi-secure and secure residential care that

aggression demonstrated by both boys and girls was very stable over time, with levels of aggression being very similar at the time of admission to and discharge from secure residential treatment. Regarding adolescents' competence skills, on the group level, Harder et al. (2012) found no significant improvement in adolescents in SRC. Nevertheless, in the same sample, Harder et al. (2012) found improvement in treatment motivation. This is an important result, since most adolescents depend on SRC because of their lack of treatment motivation (Van der Helm et al., 2018).

More promising results come from a study of 339 adolescents in SRC (Nijhof et al., 2011). Both boys and girls self-reported a significant decrease in their internalizing as well as their externalizing behavioral problems. Nijhof et al. (2011) also found significant decreases in adolescents' delinquency and substance abuse. In line with the self-reports, parent-reports also revealed a significant decrease in adolescents' problem behaviors. Furthermore, parents reported no improvement in family functioning, however, they did report a significant decrease in their parental stress. Care worker reports failed to confirm these results. According to care worker reports, no decrease was found for the internalizing problems of the adolescents, and even an increase of externalizing problem behavior was reported (Nijhof et al., 2011). The results of SRC seem to be dependent of the informant reporting. We experienced the same in our studies, with adolescents themselves reporting their own problems to be less severe than their parents did. In addition, many adolescents seem to experience problems after their discharge from SRC. These problems occur especially with regard to finances, school and employment. Most of them continue to receive help after discharge from SRC (Harder et al., 2011).

Meta-analyses by De Swart et al. (2012) and Strijbosch et al. (2015) clearly demonstrate that, on average, non-residential care achieves more positive outcomes than (secure) residential treatment. De Swart and colleagues (2012) reported that protocolled evidence-based treatment

delivered in (secure) residential care was modestly effective when compared to (secure) residential care as usual. Moreover, compared with non-residential care, (secure) residential care yielded a small and non-significant, negative effect. In addition, in a more recent meta-analysis, Strijbosch et al. (2015) found a significant but small negative overall effect comparing outcomes of (secure) residential care to non-residential care. Due to a lack of studies comparing secure residential care to non-residential care, both secure and non-secure residential care for youth were included in both meta-analyses as the experimental condition. However, these meta-analyses failed to account for initial differences (i.e., seriousness of total, internalizing, and externalizing behavioral problems, drug abuse and delinquency) between adolescents in the settings being compared. Sufficient insight into the appropriateness of non-residential interventions for adolescents with severe behavioral problems, who are otherwise referred to secure residential care, is therefore lacking. This knowledge is very relevant, since in many countries, several interventions were developed to function as a possible alternative to SRC, such as intensive home-based interventions (Cameron et al., 2011; Henggeler et al., 2002; Preyde et al., 2011), therapeutic foster care (Bergström & Højman, 2015; Chamberlain & Reid, 1998; Portwood et al., 2018) and non-residential educational facilities (Pronk et al., 2021). In addition, neither is clear how to tailor treatment in SRC effectively to the risks and needs of the adolescents in care, to improve its efficacy.

Initiatives to improve secure residential youth care

Because of the demands for better treatment effects, various initiatives were taken over the years, one of which was the development of ‘therapeutic residential care’ (TRC). In TRC there is more attention for trauma problems and developmental needs than in regular residential youth care (Ainsworth, 2017). Another initiative is the development of gender-specific youth care, since the recognition of gender-specific needs in treatment lead to better treatment results (Baynes-Dunning & Worthington, 2012; Bloom & Covington, 2001). Care organizations start

female-specific facilities because the nature of girls' history is different from that of boys and critics say treatment in SRC is mainly based on knowledge about boys (Nijhof et al., 2012).

Gender differences

In the last decades, several studies hypothesized that girls would differ from boys in their risk factors, needs and problem behavior and therefore have other treatment needs than boys (Handwerk et al., 2006; Nijhof, 2011; Rönnlund & Karlsson, 2006; Sonderman et al., 2015; Weis et al., 2005). Specifically, histories of sexual abuse, resulting in trauma problems, are more common in girls than in boys (Handwerk et al., 2006; Herman, 1997; Nijhof et al., 2018). Regarding internalizing behavior of boys and girls in SRC, several studies (Connor et al., 2004; Handwerk et al., 2006; Nijhof, 2011; Weis et al., 2005) found girls to show more internalizing behavioral problems than boys. This seems true for PTSD symptoms, anxiety scores, and depression (Jozefiak et al., 2016; Nijhof et al., 2018; Soenen et al., 2014).

In contrast, Zahn et al. (2009) found that girls are less likely to be in the clinical range of withdrawn behavior than boys are. Hamerlynck et al. (2009) showed in a study on girls in SRC, that up to 90% of girls have experienced some sort of trauma, such as physical or sexual abuse, or exposure to violence. These experiences are strongly associated with posttraumatic stress disorder (PTSD). PTSD is in turn linked to multiple mental health problems, such as anxiety, depressions, aggression, conduct problems and oppositional behavior (Kerig et al., 2009). In addition, in a study on the psychosocial needs of boys in SRC, Harrington et al. (2005) found 9% of boys to suffer from PTSD.

The effectiveness of gender-specific facilities for girls is still unknown. Neither is known whether female-specific SRC is more effective in treating girls than 'regular' SRC and whether 'regular' SRC is indeed more effective in treating boys. By comparing adolescent girls in a female-specific institution to adolescent girls in a 'regular' institution and by comparing

adolescent girls in a ‘regular’ institution to boys in the same institutions, we aim with this dissertation to fill this knowledge gap.

Aim of this thesis

We aim with this dissertation to determine the most effective way to treat adolescents in secure residential youth care. Therefore, we aim to contribute to the body of knowledge about improving the effectiveness of SRC. We also aim to show when non-residential youth care could serve as an alternative for residential youth care, for diminishing problem behavior of children and adolescents. Furthermore, we aim to determine the similarities and differences in the presence and seriousness of risks and needs of boys and girls, and to explore whether the relationship between risk factors and problem behavior are different depending on gender. And, since care organizations are starting female-specific facilities offering treatment tailored to girls risks and needs, we determine whether this treatment is indeed better suited to girls, regarding care outcomes. Lastly, we investigate the pattern of behavioral development of adolescents during placement in SRC, to study the ideal length of stay in care for both boys and girls.

Care settings

To answer the question whether boys and girls differ in the presence and seriousness of their risks and needs, to investigate whether gender-specific care for girls is of added value to diminish behavioral problems and to study the ideal length of stay of adolescents in SRC we collected data in two different SRC facilities.

Vulnerable girls who are, for example, victims of commercial sexual exploitation or human trafficking are treated at *Hestia*, a gender-specific (“girls-only”) facility. An important part of the treatment is trauma therapy, which is deemed necessary in almost all cases. Non-gender specific help is offered at *Midgaard* to the other girls (and boys) who are referred to SRC. In Table 1 the main characteristics of both SRC facilities are presented.

Table 1
Key criteria of the two settings

	Regular SRC ("Midgaard")	"Gender-specific" SRC ("Hestia")
<i>Facility</i>		
Capacity	60	30
Gender	Boys and girls	Girls
<i>Living group</i>		
Number of adolescents per living group	8 to 10	8 to 10
Number of sociotherapists per living group	2 to 3	2 to 3
<i>Treatment</i>		
Main treatment goals	Reducing behavioral problems, improving parenting skills, improving emotion regulation	Reducing behavioral problems, improving parenting skills, improving emotion regulation, preventing revictimization, improving empowerment, reducing PTSD symptoms
Treatment approach	Solution-oriented approach, system-oriented approach, cognitive behavioral approach, presence approach, social competence model, positive working alliance, shared decision making, informal mentoring, motivational interviewing, positive living group climate	As regular SRC and in addition: trauma-sensitive approach, social network analysis, family therapist involved in every case, psychomotor group therapy, workshops on healthy relationships, sexuality and intimacy.
Individual therapy (e.g. trauma therapy, family therapy, psychomotor therapy)	56% of adolescents received individual therapy	90% of adolescents received individual therapy
Average length of stay	203 days	202 days

The adolescents in secure residential 24-h care live in a living group with a highly structured daily routine, where the sociotherapists try to establish a positive living group climate. Treatment is offered under supervision of a behavioral scientist, in collaboration between the adolescent and his professional and social network. Individual therapy (e.g. trauma therapy of family therapy) is offered when indicated by a behavioral scientist or psychiatrist. Lastly, for some of the adolescents, pharmacotherapy is used for the treatment of, for example, ADHD, depression or sleep problems.

In **Chapter 2** of this dissertation we present a meta-analysis aimed at investigating whether non-residential youth care can serve as an alternative intervention to SRC, since critics have pointed out that SRC can cause harmful side effects. Through a meta-analysis, the effectiveness of residential youth care is compared to the effectiveness of non-residential youth care. Effectiveness is defined as decreases in problem behavior (i.e., internalizing, externalizing, and total behavioral problems, substance abuse, and delinquency). We compared controlled studies comparing Treatment Foster Care Oregon for Adolescents

(TFCO-A) or homebased treatment (HBT) to residential youth care. The study informs the reader about the promising outcomes of interventions serving as a possible alternative to residential care and, through moderator analyses, about the client and program characteristics that influence effectiveness.

In **Chapter 3** we include a study aimed at determining the similarities and differences in the presence and seriousness of risks and needs of boys and girls. Furthermore, the study offers insight into whether the relationship between risk factors (i.e., psychological PTSD symptoms, perceived competence, adaptive emotion regulation, and maladaptive emotion regulation reported by adolescents and the quality of the parent-child relationship and parenting problems reported by parents) and problem behavior (i.e. internalizing and externalizing behavioral problems, reported by both adolescents and their parent(s)) are different depending on gender (see Figure 1).

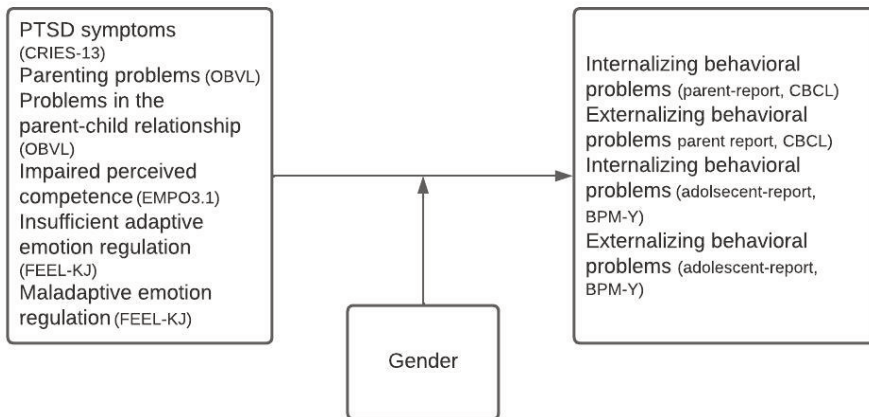


Figure 1. Variables included in the study (questionnaires used in brackets)

To study the possible gender differences in the behavioral problems and risk factors of adolescents in care we analyzed data of 255 adolescents in secure residential care in The

Netherlands. We examined both individual (e.g., perceived competence, insufficient emotion regulation) and family factors (e.g., parenting problems, problems in the parent-child relationship). Through the findings of the study clinical practice is informed whether gender-specific care is justified and whether and how treatment can be tailored to the individual needs of adolescents. Furthermore, the findings contribute to the scientific debate on the effectiveness of SRC, the risk factors for problem behavior of adolescents in placed in SRC and the possible added value of gender-specific care.

Chapter 4 reports on the findings of a study aimed at determining whether female-specific SRC is of added value for adolescent girls, regarding treatment outcomes (i.e. psychological PTSD symptoms, perceived competence, adaptive emotion regulation, and maladaptive emotion regulation reported by adolescents, and the quality of the parent-child relationship and parenting problems reported by parents, and internalizing and externalizing behavioral problems reported by both adolescents and their parent(s)).

Furthermore, the study investigates whether the effectiveness of ‘regular’ SRC is different for boys and girls. The study evaluates the treatment outcomes of adolescents in SRC, both on the group and the individual level. The added value of gender-specific care for girls is explored by comparing outcomes, in a sample of 239 adolescents, for girls in gender-specific SRC, girls in regular SRC and boys in regular SRC.

Chapter 5 presents a study aimed at exploring the developmental trajectories of adolescents’ problems during treatment in SRC. Knowledge on the developmental trajectories informs science and clinical practice about the treatment time necessary to cause change and the right moment to discharge adolescents from SRC. Therefore, I performed a longitudinal repeated measures study using single case experimental designs (SCED) on the change of internalizing, externalizing and total behavioral problems and attention problems of forty

adolescents, during their stay in SRC. Furthermore, the study is performed to determine whether the differing length of stay of adolescents can be explained by the seriousness of their problems at admission, the development of their problems during their stay, gender, age at admission, destination after discharge and the family therapy they received. Lastly, the behavioral outcomes of adolescents with a differing length of stay are explored at follow-up. The results are used to inform clinical practice about the ideal treatment duration for adolescents referred to SRC. The scientific impact can be found in adding to the debate on the effectiveness of SRC by using SCED and evaluating possible differences between adolescents with a relatively short and relatively long stay in care.

Finally, **Chapter 6** presents a general discussion of the findings of the four studies performed, regarding (1) the appropriateness of TFCO-A and HBT for adolescents regularly referred to SRC, (2) risks and needs of boys and girls referred to SRC, (3) effectiveness of SRC and of female-specific SRC in particular, and (4) behavioral development of adolescents during treatment, monitored through biweekly measurement. The risk, needs, and responsivity principles and the self-determination theory are used as a theoretical framework to interpret findings. Furthermore, implications for practice are discussed to improve outcomes of SRC for adolescent boys and girls, by better tailoring treatment to their risks, needs and individual development.

Contribution of the authors

Regarding the meta-analysis reported in **Chapter 2**, Gutterswijk, Kuiper, Van der Horst, Stams and Prinzie designed the study. Furthermore, Gutterswijk, Lautan and Kunst conducted the literature searches and coded the studies. In close collaboration with Stams, Gutterswijk, Lautan and Kunst conducted the statistical analyses. The first draft of the manuscript was written by Gutterswijk and all authors contributed to and have approved the final manuscript.

In **Chapter 3** the study on the needs and risks of boys and girls in SRC is reported. This study was designed by GutterSwijk, Kuiper, Van der Horst, Jongerling, Harder and Prinzie. GutterSwijk and Jongerling together performed the statistical analyses, after GutterSwijk had collected the data. All authors contributed to the manuscript, after GutterSwijk had written the first draft. All authors approved the final manuscript.

The study in presented in **Chapter 4** was designed by GutterSwijk, Kuiper, Harder, Bocanegra, Van der Horst and Prinzie. The data was collected by GutterSwijk and GutterSwijk conducted the statistical analyses in close collaboration with Bocanegra. GutterSwijk wrote the first draft of the manuscript. All authors contributed to this manuscript and have approved the final version of it.

And lastly, the study presented in **Chapter 5** was designed by GutterSwijk, Kuiper, Harder, Bocanegra, Van der Horst and Prinzie. The data collection was performed by GutterSwijk, and the statistical analyses were performed by GutterSwijk and Bocanegra. In line with the other studies performed, GutterSwijk wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Chapter 2

THE OUTCOME OF NON-RESIDENTIAL YOUTH CARE COMPARED TO RESIDENTIAL YOUTH CARE: A MULTILEVEL META-ANALYSIS

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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 ($d = .21$), 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 ($d = .36$) than HBT ($d = .08$).

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.

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 Kruijf, 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 undertreatment 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 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 modestly 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 $d = -.20$). 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 ($d = -.33$). 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.

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 ($r = .288$).

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 wraparound care, Suter and Bruns (2009) found a small statistically significant effect (Cohen's $d = .33$) 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 ($d = .24$) 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 $d = .48$) and alternative treatments (Cohen's $d = .35$).

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 $d = .20$), psychopathology (Cohen's $d = .27$), substance abuse (Cohen's $d = .29$), family factors (Cohen's $d = .14$), out-of-home placements (Cohen's $d = .27$), and peer factors (Cohen's $d = .21$).

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 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.

Methods

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 behavio*, behavio* problems, aggres*, violen*, criminal behavio*, antisocial behavio*, 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.

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 Figure 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 .70 to 1.00 and intraclass correlations from .99 to 1.00. In one case, the Kappa proved to be insufficient, yielding a score of .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.

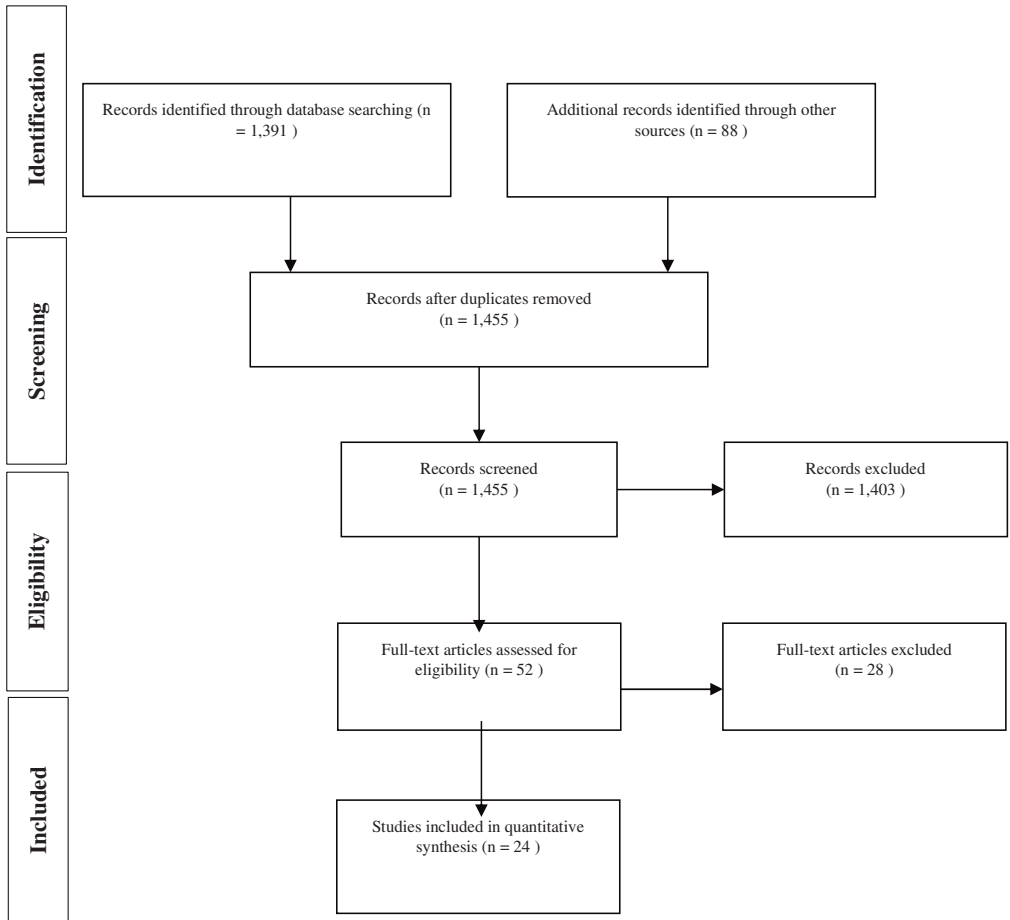


Figure. 1 Flowchart showing the results of the search strategy

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.

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).

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).

Results

Study characteristics

This meta-analysis included *k* = 24 primary studies from which *u* = 145 effect sizes were extracted. 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	<i>k</i>	#ES	Mean <i>d</i>	95% CI	Sig. mean <i>d</i> (<i>p</i>)	$\sigma^2_{\text{level 2}}$	$\sigma^2_{\text{level 3}}$	% Var. Level 1	% Var. Level 2	% Var. Level 3
Child-outcomes	24	145	.21	0.00; 0.34	.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* ≤ .001

Overall effect size

The estimated overall effect of non-residential care on behavioral problems, compared to residential youth care, was $d = .21$, $p \leq .001$, 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 Figure 2).

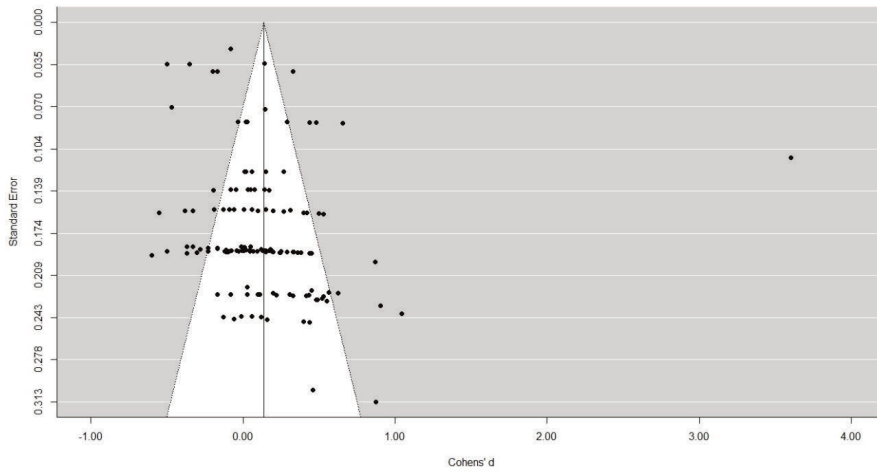


Figure. 2 Trim and fill plot for all effect sizes.

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.

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'.

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.

Between-study: Sample characteristics

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

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 ($d = .36$) on behavioral problems than HBT ($d = .08$), 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.

Table 2
Within-study Moderators of the Effectiveness of Non-residential Care: Assessment of Outcomes

Moderator variable	<i>k</i>	# <i>ES</i>	<i>B₀</i> / <i>d</i>	<i>t₀</i>	<i>B₁</i>	<i>t₁</i>	<i>F</i> (<i>df₁</i> , <i>df₂</i>)
Methodological characteristics							
<i>Measured outcomes</i>							<i>F</i> (4, 140) = 1.67
Total behavior problems	10	24	0.04	0.35			
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>							
Type of Measure							<i>F</i> (2, 136) = 2.24
Questionnaires	17	93	0.16	2.18 [†]			
Interview	3	25	0.14	1.12	-0.02	-0.14	
Official registration	11	21	0.42	3.69 ^{***}	0.26	2.08	
Informant							<i>F</i> (2, 142) = 0.51
Child	14	53	0.28	3.06 [†]			
Parent	10	41	0.16	1.75	-0.12	-0.99	
Other	19	51	0.20	2.54 [†]	-0.08	-0.77	
Time of measurement							<i>F</i> (1, 143) = 0.26
Post-test	9	48	0.20	2.80 ^{**}			
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	<i>F</i> (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.

Table 3

Between-study Moderators of the Effectiveness of Non-residential Care: Child and Methodological Characteristics

Moderator variable	<i>k</i>	#ES	B ₀ / <i>d</i>	<i>t</i> ₀	B ₁	<i>t</i> ₁	<i>F</i> (df ₁ , df ₂)
<i>Sample characteristics</i>							
Sex	24	145	0.20	3.18**	-0.00	-0.99	<i>F</i> (1, 143) = 0.99
Age	21	140	0.17	3.51***	0.02	0.76	<i>F</i> (1, 137) = 0.58
<i>Ethnicity</i>							
Percentage Caucasian White	17	94	0.25	3.17**	0.00	1.17	<i>F</i> (1, 927) = 1.37
Percentage African Black	17	87	0.27	3.50***	-0.00	-1.30	<i>F</i> (1, 85) = 1.68
Percentage Hispanic	15	84	0.18	2.83*	-0.00	-1.26	<i>F</i> (1, 82) = 1.58
<i>Methodological Characteristics</i>							
Study design							<i>F</i> (2, 142) = 0.73
RCT	13	73	0.27	3.05**			
Quasi experimental	7	28	0.22	1.81	-0.05	-0.29	
matched							
Quasi exp. non- matched	4	44	0.07	0.46	-0.20	-1.21	
Study quality							<i>F</i> (2, 137) = 0.38
Strong	8	56	0.29	2.65**			
Moderate	8	57	0.20	1.77	-0.09	-0.58	
Weak	8	32	0.15	1.25	-0.14	-0.85	
Research group							<i>F</i> (3, 141) = 1.93
Other group	11	62	0.22	2.59*			
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	

Control for pretest							$F(1, 143) = 0.74$
Control for pretest	20	129	0.33	2.27*			
No control for pretest	5	16	0.19	2.79**	-0.14	0.86	
Intention to treat							$F(1, 143) = 0.02$
Completers	11	64	0.23	2.40*			
Intention to treat	14	81	0.21	2.44*	-0.02	-0.12	
Study characteristics							
Type of experimental group							$F(1, 143) = 6.10^*$
Homebased Services	12	99	0.08	1.11			
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; B_0 / mean r = intercept/ mean effect size (r); t_0 = difference in mean r with zero; B_1 = estimated regression coefficient; t_1 = difference in mean r with reference category; $F(df_1, df_2)$ = omnibus test; (RC) = reference category. * $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

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 $d = .36$) than HBT (Cohen's $d = .08$). These findings 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 $d = .20$) and small-to-medium (Cohen's $d = .34$) effects, respectively, favoring non-residential over residential youth care. Therefore, the combined findings of previous meta-analyses 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.

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 (Handwerk, Ringle, & Fiel, 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.

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.

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.

Chapter 3

BEHAVIORAL PROBLEMS OF ADOLESCENTS IN SECURE RESIDENTIAL CARE: GENDER DIFFERENCES AND RISK FACTORS

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Abstract

Adolescents in secure residential care mostly suffer from serious behavioral problems, often accompanied by trauma and adverse family circumstances. This paper presents findings of a comparison of problem behavior and risk factors of 255 boys and girls (aged 12 to 18 years) in secure residential care in the Netherlands, and their association with behavioral problems. A cross-sectional design and standardized questionnaires were used to measure behavioral problems and individual and familial risk factors. By using independent-samples T-tests the severity of these factors in boys and girls was compared, and by using structural equation modeling (SEM), associations between these factors and behavioral problems were investigated. The findings of the study show that PTSD symptoms, maladaptive emotion regulation, impaired perceived competence and internalizing behavioral problems were more severe in girls than in boys. Boys experienced more severe externalizing problem behavior and more family problems than girls. Maladaptive emotion regulation, PTSD symptoms, perceived competence and parenting problems were related to behavioral problems. The results indicate that treatment for girls should address PTSD symptoms, perceived competence and maladaptive emotion regulation, and that extra attention for family problems in the treatment of boys is warranted.

Introduction

Secure residential youth care (SRC) provides assistance to adolescents who exhibit serious behavioral problems and live in adverse family circumstances. These adolescents need intensive and sometimes restrictive care. SRC occurs in institutions where treatment is provided in a secured environment (Eltink et al., 2017; Martin et al., 2017).

Although several meta-analyses have demonstrated that SRC can be modestly effective in reducing problem behaviors (De Swart et al., 2012; Strijbosch et al., 2015), criticism has raised questions about the appropriateness of residential care (Souverein et al., 2013). This criticism is based on the finding that in many cases, intensive home-based treatments achieve results comparable to SRC in diminishing problem behavior, without the possible iatrogenic effects of SRC (Weis et al., 2005). Treatment Foster Care Oregon for Adolescents (TFCO-A) has yielded even better results than SRC with a comparable target group, (Gutterswijk et al., 2020). Since alternative interventions cannot always sufficiently guarantee the safety of the adolescent, and therefore SRC remains necessary for a significant part of the most troubled youth, it is necessary to improve the treatment effects of SRC programs (Whittaker et al., 2016). One way to do so is to offer therapeutic residential care:

‘Therapeutic residential care’ involves the planful use of a purposefully constructed, multi-dimensional living environment designed to enhance or provide treatment, education, socialization, support, and protection to children and youth with identified mental health or behavioral needs in partnership with their families and in collaboration with a full spectrum of community-based formal and informal helping resources. (Whittaker et al., 2014, p. 24).

Another way to improve the effectiveness of an intervention is to tailor the content and intensiveness to match the characteristics of adolescents and their families (Andrews & Bonta, 2007). Furthermore, interventions should target the dynamic (i.e., those that are changeable), etiological factors of problem behaviors (DeMatteo & Marczyk, 2005; MacGuire, 1999). In the

present study behavioral problems are defined as internalizing behavioral problems (i.e. withdrawn and anxiously depressed behavior), and as externalizing behavioral problems (i.e. rule breaking and aggressive behavior) (Achenbach & Rescorla, 2001).

Research on the characteristics of adolescents in SRC has yielded a range of results with regard to the prevalence of different problems (e.g., behavioral problems, posttraumatic stress disorder, low perceived competence, problems in the parent-child relationship, maladaptive emotion regulation) (Dirkse et al., 2018; Harder et al., 2015; Nijhof et al., 2012; Van Dam et al., 2010). In this study low competence is defined as not feeling self-reliant (Damen et al., 2017) and problems in the parent-child relationship is characterized by the parent not feeling happy with the child (Veerman et al., 2014). Finally, adaptive emotion regulation is defined as coping with your emotions in a positive way (e.g., accepting, solving or forgetting your emotions, or seeking distraction), and maladaptive emotion regulation which is coping with your emotions in a negative way (e.g. to withdraw, to argue or to blame yourself) (Grob & Smolenski, 2013). However, the differences in the challenges experienced by boys and girls have been understudied. With regard to the individual (dynamic) risk factors for problem behaviors, adolescent symptoms of posttraumatic stress disorder (PTSD) are frequently reported within the population of adolescents in SRC, with estimates ranging up to 50% in studies focusing on girls (Dirkse et al., 2018). Furthermore, low competence has been identified as an individual risk factor for behavior problems in both boys and girls in SRC (Harder et al., 2015). The prevalence of problems in parent-child relationships is well documented, ranging from 42% (Nijhof, 2011) to 94% (Van Dam et al., 2010).

Although SRC programs are increasingly able to tailor their treatment to the specific protective and risk factors of adolescents and are beginning to cooperate further with adolescents' families, these programs are usually developed based on knowledge about treatment for boys, as they have constituted the main target group for many years (Nijhof &

Engels, 2015). However, 43% of today's population in Dutch SRC consists of girls (Jeugdzorg Nederland, 2019). In response to this shift in the target population (i.e. the increase in the proportion of girls in SRC), youth care organizations in the Netherlands have been starting female-specific facilities, tailoring treatments specifically to girls, because girls' experiences are hypothesized to be different from those of boys. However, evidence to support this approach is scarce, since existing research does not sufficiently clarify the extent to which the prevalence of problem behaviors and the presence of risk factors actually differs between boys and girls. It is neither clear whether these factors are related to the behavioral problems of adolescents in SRC, nor whether these relationships are different for boys and girls.

A limited number of studies have highlighted some differences between boys and girls in SRC in the presence of problem behavior and risk factors. Findings have shown that girls in residential care tend to show higher rates of internalizing problem behavior compared to boys (e.g. Handwerk et al., 2006). Other researchers found no differences between boys and girls regarding internalizing problems (Singer et al., 2000). Holtberg et al. (2016) found girls to demonstrate more externalizing problem behavior compared to boys.

In residential youth care programs indirect aggression is expressed more often among girls than among boys (Crick & Zahn-Waxler, 2003; Sonderman et al, 2015). Boys residing in these types of programs are more likely to exhibit physical aggression, whereas girls tend to display more psychological aggression (Leschied et al., 2000). These differences can partly be explained by the fact that, when the goal of aggression is to harm others, girls are best damaged by disrupting their social relationships. Boys on the other hand, are best damaged by physically assaulting them. Indirect aggression and physical aggression, respectively, are best suited to reach these goals (Menting & Orobio de Castro, 2015).

With regard to the individual risk factors for the development and persistence of behavior problems, the most frequently mentioned difference between boys and girls in

residential youth care programs is the presence of trauma-related problems (Ainsworth, 2017; Covington & Bloom, 2006). Girls tend to have higher self-reported anxiety scores, including anxiety-related PTSD symptoms (Jozefiak et al., 2016; Nijhof et al., 2018). This can be explained, by the fact that girls that are referred to residential care tend to have experienced significantly more traumatizing events than boys do (Fischer et al., 2016). Furthermore, girls exhibit greater sensitivity in developing behavioral problems as a result of traumatic events (Dornfeld & Kruttschnitt, 1992).

Girls in SRC report lower levels of competence, feeling less self-reliant, than boys (Handwerk et al., 2006; Nijhof, 2011), which makes girls more prone to exhibiting problem behavior (Harder et al., 2015; Kuther, 2002). Furthermore, low levels of perceived competence are strongly related to social anxiety and depression in adolescents (Jacquez et al., 2004; Smári et al., 2002). Problems in parent-child relationships among adolescents in SRC occur significantly more frequently among girls (66%) than boys (49%) (Nijhof, 2011). Research on the link between family functioning and behavioral problems of adolescents in SRC is scarce. Nevertheless, from the general population we know parental warmth and child-management skills are protective factors for the development of externalizing behavioral problems (Scaramella et al., 1999). Moreover, research on the general population indicates that the parent-child relationships are different for boys and girls. Girls tend to be more strongly attached to and controlled by parents than boys are (Svensson, 2004), and girls tend to be more ashamed in the face of parents when they commit rule-breaking acts (Svensson, 2004), which may indicate that a positive parent-child relationship is a more important protective factor for girls than for boys in association with problematic behavior.

Present study

Adolescents are most often referred to SRC because of their problem behavior. In accordance, problem behavior is often the main target of this type of treatment. This study

investigates both the individual (i.e., psychological PTSD symptoms, perceived competence, adaptive emotion regulation, and maladaptive emotion regulation) and family factors (i.e., parent-child relationship and parenting problems) associated with adolescents in SRC as potential protective and risk factors for problem behavior. Given that SRC is provided in order to treat behavioral problems, these individual and family risk factors can be the target of individually tailored treatments in these settings (Moltrecht et al., 2020; Wiggings et al., 2009). To the best of our knowledge, previous studies have not investigated whether these individual and family characteristics differ for boys and girls in SRC. Furthermore, it is unclear to what extent these characteristics are associated with problem behavior within this population and whether these associations are similar for boys and girls. Knowledge about the presence of these factors and associations may inform clinical practice with regard to whether gender-specific help is justified and whether, as well as how, treatment can be tailored to the individual needs of adolescents.

The research questions of this study are: (1) To what extent do individual risk factors, familial risk factors, and externalizing and internalizing behavioral problems occur in boys and girls in SRC? (2) Are there differences between boys and girls with regard to the seriousness of these risk factors and externalizing and internalizing behavioral problems? (3) To what extent are these risk factors associated with externalizing and internalizing behavioral problems? (4) Are associations between PTSD-symptoms and problem behavior and associations between the parent-child relationship and problem behavior moderated by gender?

With regard to the first question, based on previous research (e.g., Harder et al., 2015; Nijhof et al., 2012), it is expected that PTSD-symptoms, problems within the parent-child relationship and behavioral problems occur frequently (i.e., in more than half of the adolescents) within the sample. Second, it is expected internalizing problem behavior and psychological PTSD symptoms to be more severe among girls, in line with findings by Jozefiak et al. (2016)

and Nijhof et al. (2018) and externalizing problems behavior to be more severe among boys, as was found before in research in SRC (Leschied et al., 2000). It is hypothesized that the aforementioned individual and familial risk factors are moderately positively correlated with internalizing and externalizing behavioral problems, since similar results were found in the general population (e.g., Svensson, 2004). With regard to the fourth question, in line with findings in the general population and in residential care, we expect that girls' psychological PTSD symptoms are more strongly associated with internalizing behavioral problems and that boys' PTSD symptoms are more strongly associated with externalizing problems (Dornfeld & Kruttschnitt, 1992; Farley et al., 2020). Finally, we hypothesize in line with findings in the general population that the qualities of parent-child relationships are more strongly linked with behavioral problems for girls than for boys (Svensson, 2004).

Methods

First, approval of the research plan was received by the medical ethical review committee. Secondly, data were collected at admission, in a population of adolescents, referred to SRC in The Netherlands. For inclusion in this cross-sectional study, the following criteria were used: (1) the adolescent stayed in care for at least 6 weeks, (2) mastered the Dutch or English language, and (3) participation of the adolescent would not interfere with the treatment alliance with the therapists. To include the response of the parents (and guardians) as well, they also needed to master the Dutch or English language and their participation would not harm the treatment alliance between them and the care professionals.

Case file information (e.g., age, ethnicity, daytime activities, previous living situation) was used to describe the sample, and questionnaires were filled out at admission by a biological parent (in some cases substituted by a legal guardian) and the adolescents themselves. Parents (or guardians) and adolescents filled out the questionnaires within two weeks after admission. For this study, ratings of the behavioral problems of both the parents and the adolescents

themselves were used, as their ratings are not interchangeable and yields unique information (Rescorla et al., 2017).

All information collected was first used as input for designing the treatment plan. To use the data in this study, a written informed consent was obtained from the adolescents and their parents (or legal guardians).

Participants

Every adolescent and his or her family, admitted to two SRC settings in The Netherlands in the period September 2016 to July 2019, was asked to participate in the study ($N = 318$). Sixty-three adolescents (19.8%) who left the institution within six weeks of admission were excluded from this study, because after the observation period it became clear that this type of care was inappropriate for these adolescents, and so they were not part of the target group of SRC. As for the parents, two of them (0.6%) did not master the Dutch or English language, and in eight cases (2.5%) contact with the parents would have interfered with the treatment of the adolescent and where therefore excluded from the study. In two cases (0.6%), the working alliance between the parents and the care professionals was so fragile, that involvement of a third party, in this case the researchers, could overload this working relationship. Accordingly, these parents were excluded from the study. Among the remaining 255 eligible adolescents identified, at least one questionnaire was completed for 239 of them. The response rate for adolescents was 88.9% ($N = 227$) and for parents 66.3% ($N = 169$). In 15 cases, the questionnaires were filled out by both parents together. In 114 cases, only the mother filled out the questionnaires, in 25 cases only the father did. In 15 other cases, the questionnaires were filled out by a 'substitute' parent, for example a foster parent, a grandparent or a (much) older sibling.

The total sample consisted of 115 boys and 140 girls. There were no adolescents who self-identified as non-binary or transgender. Therefore, all participants are considered as cis.

To check whether the sample is representative for the entire population of SRC, participants and non-participants were compared (i.e. those who were asked to participate but did not agree). Significantly more participants (54.9%) than non-participants (31.0%) were female ($\chi^2(1, N = 255) = 6.79, p < .01$). The average age of participants did not differ ($M = 15.58$ years, $SD = 1.38$) from that of non-participants ($M = 15.76$ years, $SD = 1.36$) ($t(253) = .29, p = .51$).

Setting

In line with the most common problems among adolescents in SRC the primary goal of the treatment in the two participating secure residential 24-h facilities is reducing behavioral problems and improving parenting skills (Eltink et al., 2017; Martin et al., 2017). Moreover, improving emotion regulation is another important goal of the treatment. For girls who have been a victim of commercial sexual exploitation or other types of sexual abuse preventing revictimization, improving empowerment and treating PTSD are the main goals of treatment. In order to treat these girls, a trauma-sensitive approach is used, followed by trauma therapy.

The adolescents live in a living group (8-10 adolescents) with a highly structured daily routine, guided by two to three sociotherapists, supervised by a behavioral scientist. The sociotherapists try to achieve a positive living group climate as the basis for treatment (Van der Helm et al., 2018). The average length of stay for boys and girls in these facilities is 203 days. Within the first six weeks after the adolescents has been admitted to the institution, an individual treatment plan is established, under supervision of a behavioral scientist, in collaboration between the adolescent and his professional and social network. In the present sample, 56% of the adolescents received individual therapy (e.g., trauma therapy, cognitive behavioral therapy, dialectic behavioral therapy), and all adolescents went to an on-site school for special education. During treatment, adolescents' parents and social network are involved by using the shared decision making model (Langer & Jensen-Doss, 2018) and by appointing an informal mentor, chosen by the adolescents themselves (YIM: Youth Initiated Mentor; Van Dam et al., 2017).

Furthermore, a family counselor is appointed when problems were identified in the family context (e.g., insufficient parenting skills, high parenting stress, a problematic parent-child relationship). The treatment is based on several approaches: a solution-oriented approach, a system-oriented approach, a cognitive behavioral approach and the social competence model. Furthermore, in contact with the adolescents sociotherapists use elements of motivational interviewing. Lastly, for some of the adolescents pharmacotherapy is used for the treatment of, for example, ADHD, depression or sleep problems.

During treatment, the adolescents stay in a secured environment. Over time, the stay in SRC becomes less restrictive and adolescents go on leave to their parents' home or other supporting people from their social network. These visits are utilized to get the adolescents used to life outside the institution again. Since not all adolescents return home after treatment in SRC, other adolescents are prepared for a suitable treatment trajectory after their stay in SRC.

Variables and instruments

Child behavior checklist 6-18 (CBCL)

To assess internalizing and externalizing behavioral problems, two subscales (32 and 35 items, respectively) of the Dutch version of the CBCL (Achenbach & Rescorla, 2001; Verhulst & Van der Ende, 2013) were filled out by parents or substitute caregivers. Answers are given on a three-point Likert scale (0 = *not true*, 1 = *sometimes true* and 2 = *very true*), (e.g., 'My child argues a lot'). Scores between the 93rd-97th percentile are considered 'borderline' and any score above the 97th percentile is considered 'clinical' (Achenbach & Rescorla, 2001). Internal consistency of the internalizing problems scale and the externalizing problems scale in the present study was $\alpha = .90$ and $\alpha = .94$ respectively.

Brief problem monitor-youth (BPM-Y)

The BPM-Y is the shortened version of the youth self-report (YSR), which is similar to the CBCL, but filled out by the adolescents themselves. The answering format is similar to that

of the CBCL: a three-point Likert scale (0 = *not true*, 1 = *sometimes true* and 2 = *very true*). The subscales ‘internalizing behavioral problems’ (6 items) and ‘externalizing behavioral problems’ (6 items) were used (e.g., ‘I am disobedient in school’) (Achenbach & Rescorla, 2001; Verhulst & Van der Ende, 2013). The internal consistency of both the internalizing problems scale and the externalizing problems scale in the present study was $\alpha = .94$.

Children’s Revised Impact of Event Scale (CRIES-13)

The CRIES-13 is a self-report instrument to screen for psychological symptoms of post-traumatic stress disorder (PTSD) (Olf, 2005; Smith et al., 2002). The instrument consists of 13 items, asking the adolescent what impact a certain stressful event has had on his well-being the past seven days (e.g., ‘Do other things make you think about the event?’). The answers are given on a four-point scale (0 = *never*, 1 = *rarely*, 3 = *sometimes* and 5 = *often*). The CRIES-13 has very good psychometric characteristics to identify children with and without PTSD as determined by the ADIS-C ($auc = 0.91$, 95% CI .88-.94). A cut-off score of ≥ 30 was found to offer the best balance between sensitivity (.88) and specificity (.76) (Verlinden et al., 2014), indicating an increased risk on PTSD (Verlinden & Lindauer, 2015). In the present sample an internal consistency of $\alpha = .91$ was found.

Empowerment questionnaire (EMPO 3.1)

From the EMPO 3.1 the subscale ‘intrapersonal empowerment’ was used, which measures the feeling self-reliant and have a grip on life. This subscale was completed by the adolescent and consists of eight items (e.g., ‘I do not worry quickly’). Items are scored on a five-point Likert-scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *do not agree/do not disagree*, 4 = *agree*, and 5 = *strongly agree*). A total score of 16 or lower indicates that the adolescent needs treatment to improve his intrapersonal empowerment (Damen et al., 2017). The internal consistency was $\alpha = .80$ in the present sample.

Parenting Stress Questionnaire (OBVL)

The OBVL is a self-report questionnaire, filled out by parents, measuring parenting stress (e.g., ‘I feel happy when my child is by my side’). In the present study, the subscales ‘parent-child relationship’ (6 items) and ‘parenting problems’ (7 items) were used, where parents assess the quality of their own situation. The questions are answered on a 4-point-scale (1 = *does not apply*, 2 = *applies a little*, 3 = *applies fairly* and 4 = *applies completely*). Scores on the subscale of problems in the parent-child relationship range from 6 to 24, where a score of 14 or higher indicates severe problems, for which treatment is indicated. Scores on ‘parenting problems’ range from 7 to 28, where a score of 18 or higher indicates severe problems (Veerman et al., 2014). In the present study, the internal consistency for the parent-child relationship was $\alpha = .91$, for the subscale parenting problems $\alpha = .85$, and for the total OBVL $\alpha = .92$.

FEEL-KJ (emotion regulation)

The FEEL-KJ (FEEL-children and adolescents; Grob & Smolenski, 2013) is an instrument, consisting of 90 items (e.g., ‘I try to change what makes me angry’), to measure emotion regulation. The questionnaire was filled out by the adolescents. The answers are scored on a five-point Likert-scale (1 = *almost never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often* and 5 = *almost always*). The instrument consists of three subscales, measuring to what extent the participant uses with a specific emotion regulation strategy: adaptive strategies (42 items), maladaptive strategies (30 items), and external regulatory strategies (18 items). In this study the two subscales adaptive and maladaptive strategies were included. The scores on the subscale adaptive strategies can range from 42 to 210 and on the subscale maladaptive strategies from 30 to 150. A total score of 103 or lower indicates adaptive emotion regulation to be below average, and treatment is wished for. In addition, a score on the maladaptive subscale of 95 or higher indicates maladaptive emotion regulation to be dysfunctional (Grob & Smolenski, 2013). An internal consistency of $\alpha = .97$ was found for the subscale adaptive strategies and $\alpha = .91$ for the subscale maladaptive strategies in the present study.

Data analysis

In order to answer the first aim, the percentage of clinical cases in boys and girls was computed (Table 1).

In preliminary analyses, the associations between the risk factors and behavioral problems were examined by means of bivariate correlation analyses. To explore whether boys and girls differed on average scores for behavioral problems and risk factors (our second aim), independent-sample T-tests were performed, using the Statistical Package for the Social Sciences (SPSS version 25, IBM, Armonk, NY, USA).

To study whether the individual and familial problems are related to externalizing and internalizing behavioral problems, (aim 3), the hypothesized model was tested through structural equation modeling (SEM) with bootstrapping, to account for the non-normal distribution of the data, using MPLUS software version 8 (Muthén & Muthén, 1998-2010). SEM was used since multiple outcome measures were included (i.e. internalizing problem behavior reported by the adolescents and by their parents, and externalizing problem behavior reported by the adolescents and by their parents), and these outcome measures were found not to be independent of each other. Analyses of missing data showed data were missing at random (MAR). In our SEM, Full-Information Maximum Likelihood (FIML) was used to account for incomplete data, as recommended by Wothke (1998). Structural equation modeling (SEM) was also used to test for the hypothesized moderating effects of gender on the link between psychological PTSD symptoms and problem behavior (aim 4a) and on the link between parent-child relationship and behavioral problems (aim 4b) in separate models. The number of moderation effects was limited because of the limited statistical power. PTSD symptoms and problems in the parent-child relationship were included in this analysis since previous research indicated that the link between these risk factors and problem behavior could be different for boys and girls.

As all of the models are saturated, the model fit could not be interpreted.

Results

Presence of problem behavior in boys and girls

Regarding the first aim of the study, behavioral problems within the clinical range were present in 77.8% of the adolescents in SRC, according to parents or substitute caregivers. A combination of clinical scores on both internalizing and externalizing behavioral problems was found in 64.9% of the adolescents. Symptoms of post-traumatic stress disorder were also widely present, in almost half of the girls and one fifth of the boys, reported by adolescents. Self-reported impaired perceived competence is present less often than PTSD symptoms in both boys and girls, but girls did show them more than twice as often (7.7%) as boys (3.0%) (see Table 1). Parent-reports show that problems within the family context were statistically significant more present among boys than among girls. More precisely, 27.6% of parents of girls reported to experience (severe) problems in the relationship with their daughter, compared to 50.7% of the parents of boys. Furthermore, 30.7% of the parents of the girls rated their own parenting as problematic, compared to 45.3% of the boys' parents.

Table 1
Percentages adolescents with problem behavior in clinical range at admission (parent-report and adolescent-report)

	Boys			Girls		
	Total <i>N</i>	<i>N</i> problematic	%	Total <i>N</i>	<i>N</i> problematic	%
<i>Behavioral problems</i>						
Internalizing behavioral problems ¹	78	54	69.2	91	70	76.9
Externalizing behavioral problems ¹	78	70	89.7	91	69	75.8
<i>Family context</i>						
Problems in the parent-child relationship ¹	75	38	50.7	87	24	27.6
Parenting problems ¹	75	34	45.3	87	27	30.7
<i>Individual problems</i>						
PTSD symptoms ²	99	20	20.2	120	58	48.3
Insufficient adaptive emotion regulation ²	89	20	22.4	111	33	29.7
Maladaptive emotion regulation ²	89	9	10.1	111	22	19.8
Impaired perceived competence ²	100	3	3.0	129	9	7.7

Note. The table shows the percentage of boys and girls with problems within the clinical range, based on the cut-off scores of the instruments

¹Parent-report

²Adolescent-report

To investigate differences between boys and girls in behavioral problems at admission, independent-sample T-tests were performed on the data of the 239 participants (aim 2, Table 2).

Table 2
Gender differences in behavioral problems and risk factors

	Boys			Girls			Test
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	
<i>Behavioral problems</i>							
Internalizing behavioral problems ¹	78	16.39	9.2	92	18.57	10.30	t(168) = 1.45 ^{ns}
Externalizing behavioral problems ¹	78	32.12	12.70	92	26.70	13.86	t(168) = -2.64**
Internalizing behavioral problems ²	105	2.34	2.72	127	3.80	2.99	t(230) = 3.83***
Externalizing behavioral problems ²	105	3.55	2.51	127	3.92	2.42	t(230) = 1.14 ^{ns}
<i>Family context</i>							
Problems in the parent-child relationship ¹	75	13.79	4.69	87	11.24	4.33	t(160) = -3.59***
Parenting problems ¹	75	18.40	4.41	88	16.15	4.48	t(161) = -3.22**
<i>Individual problems</i>							
PTSD symptoms ²	99	17.38	13.23	120	28.63	17.58	t(217) = 5.26***
Insufficient adaptive emotion regulation ²	89	128.21	34.61	111	122.87	35.09	t(198) = -1.08 ^{ns}

Maladaptive emotion regulation ²	89	69.00	18.92	111	78.37	21.96	$t(198) = 3.19^{**}$
Impaired perceived competence ²	98	30.14	6.56	116	25.66	6.19	$t(212) = -5.13^{***}$

Note. Significant differences are presented in bold.

* $p < .05$

** $p < .01$

*** $p < .001$

¹Parent-report

²Adolescent-report

As can be seen in Table 2, the independent-samples T-tests indicated that girls showed more severe internalizing behavioral problems than boys did, according to their self-reports ($t(230) = 3.83; p < .001$). Girls also reported more severe PTSD-symptoms ($t(217) = 5.26; p < .001$), lower perceived competence ($t(212) = -5.13; p < .001$) and more maladaptive emotion regulation ($t(198) = 3.19; p < .01$) than boys did.

Based on parent reports, boys suffer from more severe externalizing problem behavior ($t(168) = -2.64; p < .01$) and problems in the parent-child relationship ($t(160) = -3.59; p < .001$) than girls do. Finally, parents of boys reported to experience more problems in their parenting ($t(161) = -3.22; p < .01$) than parents of girls did.

The association of possible risk factors and problem behavior

To examine to what extent PTSD symptoms, perceived competence, emotion regulation, parenting problems and problems in the parent-child relationship are associated with externalizing and internalizing behavioral problems (aim 3) a SEM model (Figure 1) was tested ($N = 239$). For the sake of clarity, only the significant relationships are presented in Figure 1. Assumptions were tested (Muthén & Muthén, 1998-2010).

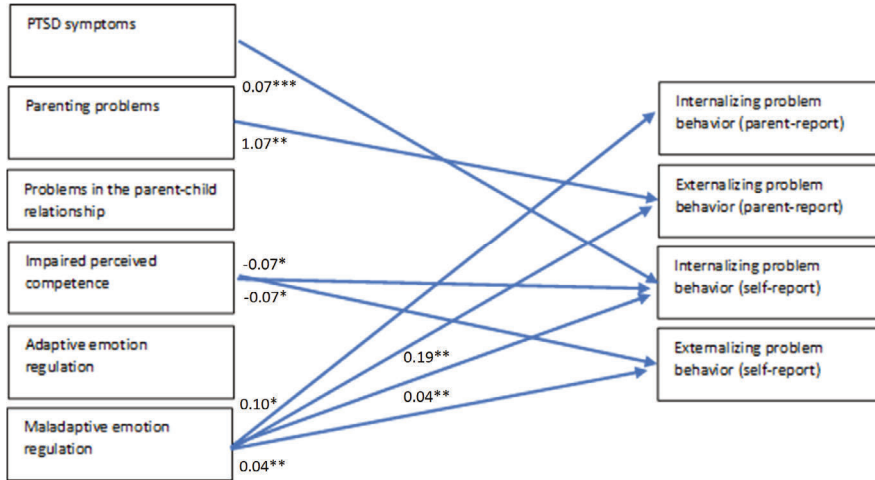


Figure 1. Research model with the relations between risk factors and externalizing and internalizing behavioral problems reported by parents and youth.

* $p < .05$ (in bold)

** $p < .01$ (in bold)

*** $p < .001$ (in bold)

*Only the estimates of significant associations are presented

The model explained 11.3% of the variance in parent-reported internalizing problem behavior ($R^2 = .113$; $p = .04$), and 28.3% of the variance in parent-reported externalizing problem behavior ($R^2 = .283$; $p < .01$), respectively. The explained variance by the model on adolescent-reported scores on internalizing behavioral problems was 41.9% ($R^2 = .419$; $p < .01$), and 27.3% on externalizing behavioral problems ($R^2 = .273$; $p < .01$). As can be seen in Figure 1, higher scores on adolescent-reported maladaptive emotion regulation were related to more externalizing (adolescent-report, $b(SE) = 0.04(0.01)$, $\beta = .32$, $p < .01$; parent-report, $b(SE) = -0.19(0.06)$, $\beta = .30$, $p < .01$) and more internalizing behavioral problems (adolescent-report, $b(SE) = 0.04(0.01)$, $\beta = .29$, $p < .01$; parent-report, $b(SE) = 0.04(0.01)$, $\beta = .22$, $p = .03$). Furthermore, self-reported impaired perceived competence was significantly related to both internalizing ($b(SE) = -0.07(0.03)$, $\beta = -.17$, $p = .03$) and externalizing problem behavior ($b(SE) = -0.07(0.03)$, $\beta = -.21$, $p = .02$), when reported by adolescents. In addition, adolescent reported PTSD symptoms, were positively and significantly related to adolescent internalizing behavior problems ($b(SE) = 0.07(0.01)$, $\beta = .36$, $p < .01$).

Regarding associations with family factors, the parental experience of their parenting problems was significantly related to externalizing problem behavior (parent-report) ($b(SE) = 1.07(0.32), \beta = .37, p < .01$).

Interaction effects of gender

By using SEM, the interaction effects were tested to investigate whether gender moderated the association of PTSD symptoms on behavioral problems (aim 4a) and the association of parent-child relationship on behavioral problems (aim 4b) in two different models. The structural equation models indicated that both associations were not significantly moderated by gender.

Discussion

The findings of this study reveal that several well-known risk factors for problem behavior (e.g., PTSD symptoms, poor perceived competence, and maladaptive emotion regulation) are present to varying degrees in adolescents in SRC. The presence of some of these factors appears to be related to gender. Furthermore, some of these factors were found to be specifically associated with internalizing and externalizing problem behavior within this research sample. These associations do not appear to differ for boys and girls.

The first aim of this study was to explore the extent to which individual and familial risk factors and behavioral problems are present in adolescents admitted to SRC in the Netherlands. In most cases, these adolescents are referred to SRC because of severe behavioral problems (Eltink et al., 2017). It therefore comes as no surprise that 70 to 90% of the adolescents in this study exhibited behavioral problems within the clinical range at admission. However, according to parent reports, 22.2% of the adolescents displayed no behavioral problems within the clinical range. A possible explanation for these adolescents being referred to SRC nevertheless, is that the placement was simply the outcome of poor family circumstances, inadequate parenting or the safety of the adolescents was highly threatened by others (e.g., sexual commercial

exploitation, honor killing or abuse). Back in 2010, Van Dam et al. found 99% of adolescents to exhibit externalizing problem behavior when admitted to SRC, and 89% of adolescents to show internalizing problem behavior. Internationally, the broader term 'residential care' is often used, which complicates comparisons with secure residential care. Nevertheless, it is informative to know that adolescents admitted to residential care show externalizing behavioral problems in 35%-85% of the cases (Connor et al., 2004; Martin et al., 2017). Handwerk et al. noticed adolescents to show at least one type of disorders (i.e. anxiety disorder, depressive disorder, disruptive behavior disorder or substance disorder) in 64% of the cases. Furthermore, internalizing problem behavior was found in 46%-49% of adolescents (Connor et al., 2004; Martin et al., 2017). Based on this additional information it is safe to say that it is common for not all adolescents referred to residential care facilities to display behavioral problems. In addition, problems in the familial context were present in about a third of the adolescents in the present study. Symptoms of PTSD were also widely present in the population, found in almost 36% of the adolescents. However, these numbers are lower than expected. Since this information is based on self-reports, under-reporting by adolescents may explain this difference. On the other hand, previous research has shown percentages of adolescents in SRC to display symptoms of PTSD to be as low as 18% (Dirkse et al., 2018). In residential care, percentages of 40% (Lord et al., 2021), 24% (Collin-Vézina et al., 2011), 16% (Harr et al., 2013) to even 0.6% in residential youth care (Jozefiak et al., 2016) were found. However, significantly more adolescents referred to SRC have experienced one or more traumatizing events. Van Dam et al. (2010) found 58% of adolescents to have experienced one or more traumatic events (e.g., passing away of a parent, sexual abuse or child abuse) and in residential youth care, Martin et al. (2017) found 46% of adolescents to have experienced child abuse. However, not every traumatic event leads to the exhibition of PTSD symptoms. A study by Collin-Vézina (2011) showed the more traumatizing events an adolescent experiences, the more

likely the display of posttraumatic stress becomes. Furthermore, the more likely it becomes that adolescents experience difficulties in their social functioning (Ellis et al., 2012; Lord et al., 2021). The information at admission was collected within two weeks of entering SRC. It is possible that in this stage adolescents have limited awareness of their problems. Furthermore, reporting trauma symptoms requires a high degree of openness from the adolescents, which may not always have been the case. Moreover, most adolescents are referred to SRC as a result of their behavioral problems. The presence of certain risk factors is therefore not self-evident.

At the start of this study, it was expected that PTSD-symptoms, problems within the parent-child relationship and behavioral problems would be present in at least half of the adolescents. This was confirmed for PTSD symptoms in girls and for behavioral problems in both boys and girls. The greatest contrast between the results of the present study and previous research was found for impaired perceived competence, which was found to occur only in around 5% of the population. This is much less than the 36.8% that was reported by Harder and colleagues (2015). Additional research on the presence of low perceived competence, and even on the much broader concept of low self-esteem, is unavailable. Since we know the self-esteem is strongly correlated to adolescents' perception of their quality of life (Barendregt et al., 2015; Jozefiak et al., 2017), further research is necessary.

With regard to risk factors, it was hypothesized that the presence of PTSD symptoms and both internalizing and externalizing problem behaviors would differ between boys and girls, in line with previous research (Ainsworth, 2017; Covington & Bloom, 2006). The mean scores reveal that PTSD symptoms and internalizing problem behavior as reported by adolescents are indeed more severe among girls than boys. An explanation for this finding is that girls that are referred to residential care tend to have experienced significantly more traumatizing events in the past than boys do (Fischer et al., 2016). Moreover, a significant part of the adolescent girls in our study sample were victims of commercial sexual exploitation.

Furthermore, girls displayed lower perceived competence than boys and used more maladaptive emotion regulation strategies. On the other hand, parents of boys reported that the externalizing behavioral problems of their sons were more severe than those of girls. Furthermore, parents reported statistically significantly more problems in the parent-child relationship than the parents of girls, and the parents of boys also experienced more parenting problems. This is in contrast to findings of Nijhof (2011), who found girls in SRC to show more problems within the parent-child relationship than boys. There is no clear explanation for this difference. Unfortunately, research on the differences between boys and girls in SRC is scarce. Therefore, it is not possible to further explore this comparison. Already some 15 years ago, Connor and colleagues (2004) explored differences in boys and girls in residential care. In their study, they found that girls showed higher levels of internalizing problem behavior, as well as, in contrast to our findings, higher levels of externalizing problem behavior than in boys. It has already been suggested back in 2004 that girls had a higher threshold with regard to their externalizing behavior than boys, before they were admitted to SRC (Connor et al., 2004). The findings of this study seem to indicate that such a higher threshold for girls no longer exists nowadays. However, recent research also showed girls to demonstrate a higher level of externalizing problem behavior compared to boys (Holtberg et al., 2016). A possible explanation for the girls in our sample showing less severe externalizing problems than boys is the fact that some of the girls were victims of sexual exploitation, being referred to SRC because of their vulnerability and not their problem behavior. Another innovative element of the present study is that the differences in emotion regulation, perceived competence, PTSD-symptoms, the parent-child relationship and parenting problems were examined as well, in addition to the outcomes explored by Connor and colleagues (2004).

The third aim of this study was to explore the extent to which individual and familial risk factors are associated with internalizing and externalizing behavioral problems. A moderate

association was expected between all risk factors and problem behaviors, but this was only partly confirmed by the results. A moderate association was found for PTSD symptoms, perceived competence, and maladaptive emotion regulation with adolescent-reported internalizing problem behavior. In addition, perceived competence and maladaptive emotion regulation was found to be moderately associated with adolescent-reported externalizing problem behaviors and parenting problems. Furthermore, maladaptive emotion regulation and parenting problems were moderately related to parent-reported externalizing behavioral problems. Lastly, only maladaptive emotion regulation was found to be significantly related to parent-reported internalizing problem behaviors. This underlines the importance of a client-oriented approach to targeting problems with parenting, perceived competence, maladaptive emotion regulation, and PTSD in order to improve the externalizing problem behavior (Moltrecht et al., 2020; Wiggings et al., 2009). Baker, Archer and Curtis (2007) found, in their study of youth in residential treatment centers in the United States, sexual abuse to be associated with internalizing problem behavior of girls and externalizing problems of boys. In the present study PTSD symptoms were only associated with self-reported internalizing problem behavior, for both boys and girls. There are several possible explanations for this difference: first, Baker and colleagues (2007) dichotomized the presence of behavioral problems, while we used a continuous measure, which can lead to different findings, since dichotomizing does not take into account the seriousness of the problems. Secondly, PTSD symptoms and a history of sexual abuse are not exactly the same, and third, whereas PTSD symptoms were measured using self-reports in the present study, Baker and colleagues used file analysis.

Finally, the findings of the present study suggest that neither the relationship between PTSD symptoms and behavioral problems, nor the relationship between problems in the parent-child relationships and behavioral problems is moderated by gender. This seems to indicate that these associations do not differ for boys and girls. A possible alternative explanation for not

finding a significant interaction effect is the limited size of the sample used. Furthermore, there can also be other variables, not included in this study, that interfere with the relationships mentioned (e.g., support by parents, coping strategies).

Limitations

The findings of the present study should be interpreted with some limitations in mind. First, this study has used a cross-sectional design, and is thus not suitable for drawing conclusions about causality. Second, the sample originates from two Dutch SRC institutions. It remains unclear to what extent our findings can be generalized to other SRC facilities. Third, not all adolescents admitted to the two residential youth care locations during the inclusion period participated in the study. Significantly more boys objected to participation than girls. Fourth, PTSD symptoms, perceived competence, and adaptive and maladaptive emotion regulation were self-reported by adolescents, which may have led to a distorted image of these factors (Donaldson & Grant-Vallone, 2002). Fifth, although several risk factors were tested for associations with problem behaviors, other factors, such as peer influence, cannot be ruled out, as they play an important role in predicting externalizing and internalizing behavioral problems. Measuring the influence of these factors would have required additional participation by professionals, parents, and adolescents. However, the maximum effort that could have been asked of these participants for the purposes of this study had already been reached.

Implications for clinical practice and future research

The findings demonstrate that PTSD symptoms, low adaptive and high maladaptive emotion regulation, parenting problems, and problems in the parent-child relationships often occur in adolescents in SRC. Since the findings also indicate that PTSD symptoms, parenting problems, low perceived competence, and maladaptive emotion regulation are related to behavioral problems, these risk factors need to be prioritized in treatment plans, offering evidence-based care that matches the risk factors. Furthermore, the present study demonstrates

that PTSD symptoms, internalizing problem behavior and maladaptive emotion regulation are more severe in girls than in boys and that girls exhibit lower perceived competence than boys. Therefore, a gender-specific treatment approach seems warranted. An approach tailored to girls should focus more on the treatment of PTSD and improving perceived competence. For instance, a program for girls could concentrate on using EMDR (Eye Movement Desensitization and Reprocessing) (Rodenburg et al., 2009), trauma-focused cognitive behavioral therapy (Lenz & Hollenbaugh, 2015), Narrative Exposure Therapy (NET) (Grech & Grech, 2020), Youth Empowerment Programs (YEPs) (Morton & Montgomery, 2013), or Competitive Memory Training (COMET) (Korrelboom et al., 2011), since these interventions target those risk factors that are more prominent in girls. Moreover, emotion regulation can be improved through cognitive behavioral therapy (Braet et al., 2014). However, it is not only necessary to treat trauma related problems, traumatized adolescents also require a specific approach during treatment. First of all, extensive diagnostics are recommended to prevent the problem from being misinterpreted, which often leads to the use of inappropriate interventions. Secondly, especially adolescents with a history of sexual abuse tend to engage in problematic sexualized behavior, putting themselves and their peer at an increased risk of harm. Thirdly, one should be aware that placement in SRC itself can be re-traumatizing (Zelechowski et al., 2013). On the other hand, in this study, boys self-reported more maladaptive emotion regulation and more problems within the familial context. These findings indicate that while the residential sector is already working to increase the involvement of parents and social networks in treatment programs (Whittaker et al., 2016), boys in particular could benefit from the simultaneous treatment of their parents. For example, these approaches could aim to improve parenting skills (Sanders & Kirby, 2014). Furthermore, care professionals can help improve relationships between adolescents and their parent(s) using appropriate interventions, such as multisystemic therapy (MST) (Stouwe et al., 2014; Wiggings et al., 2009) and functional family

therapy (FFT) (Vardanian et al., 2019). However, although certain risk factors are on average more present in boys or girls, this does not exclude the possibility that adolescents of the opposite sex also have these risk factors. Therefore, performing comprehensive diagnostics at the time of admission is extremely necessary, in order to provide tailored treatment.

Although some studies have addressed the treatment of risk factors and behavioral problems, further research is necessary to widen the sector's knowledge about which adolescents benefit from treatment in SRC and which adolescents do not.

Conclusion

Based on the results of this study, we conclude that adolescents referred to SRC face a range of problems, both at the individual and familial levels, and that general treatment programs may be insufficient in meeting individuals' specific needs. Boys and girls have been found to differ in some areas, but not with regard to the association between risk factors and behavioral problems.

As for treatment interventions, there is no "one size fits all" program. The findings of the present study indicate that the provision of gender-specific care is justified, but even more importantly, our findings demonstrate the general need for the provision of more individualized and customized care. This is in accordance with the *Consensus Statement of the International Work Group on Therapeutic Residential Care*, which calls for custom-designed interventions to match the individual needs and strengths of adolescents (Whittaker et al., 2016). This follows from the fact that, although boys and girls seem to differ in terms of the seriousness of several risk factors, the presence of these risk factors is not entirely determined by gender. To improve effectiveness and appropriateness of SRC more knowledge is needed about which adolescents benefit from secure residential treatment programs and the additional effects of gender-specific interventions.

Chapter 4

ASSOCIATIONS BETWEEN SECURE RESIDENTIAL CARE AND POSITIVE BEHAVIORAL CHANGE IN ADOLESCENT BOYS AND GIRLS

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Abstract

Secure residential youth care facilities try to optimize their help by offering gender-specific treatment, in an attempt to achieve positive behavioral change in adolescents. In this study, we examined behavioral change in a sample of 239 Dutch adolescents (M age = 15.59 years, SD = 1.36 years, 54.9% girls) in secure residential care. Pretest, posttest and follow-up measurements were carried out for behavioral problems, PTSD symptoms, emotion regulation, perceived competence and family problems. Comparisons were made between girls in gender-specific care, and girls and boys in regular care. Missing data analyses revealed the dataset contained many missing values. Analyses were performed at group level, using MANCOVA, ANCOVA's and bootstrapped planned contrast, and at case level, using the Reliable Change Index. At group level, results revealed higher effectiveness of gender-specific care for girls compared to regular care for girls, only in diminishing externalizing behavioral problems. Overall, there were more similarities than differences in the effectiveness of gender-specific versus regular help. At individual level, 0% to 58% of the adolescents improved during their stay in secure residential care. However, most adolescents showed no change (25% to 88%) or even deterioration (0% to 39%). These results strongly emphasize the need for alternative interventions.

Introduction

Secure residential youth care (SRC) offers treatment to adolescents suffering from multiple problems (e.g., (complex) trauma, insufficient emotion regulation, parents lacking parenting skills, externalizing and internalizing behavioral problems) (Eltink et al., 2017; Nijhof, 2011). However, the most common reason for placement in SRC is adolescents exhibiting serious behavioral problems and regularly growing up under adverse family circumstances (Eltink et al., 2017; Martin et al., 2017). Therefore, the primary goal of the treatment in SRC is reducing behavioral problems and improving parenting skills, but also diminishing risk factors and strengthening protective factors (Eltink et al., 2017; Martin et al., 2017).

For various reasons, secure residential treatment of youth has been heavily criticized in recent years. The possible iatrogenic effects of incarceration are an essential element of this criticism (Weis et al., 2005), and are caused by occupational and psychosocial deprivation, coercion, repression (Van IJzendoorn et al., 2020), deviancy training (Souverein et al., 2013; Weis et al., 2005), or the restriction of autonomy of the adolescents (Ryan & Deci, 2017). In addition, secure residential youth care is the most expensive type of youth care that provides treatment in institutions, instead of within the family (James, 2017).

Since the percentage of girls present in SRC has increased significantly in recent years (Griffith et al., 2009), another point of criticism is that treatment in secure residential youth care is mainly based on knowledge about boys (Nijhof et al., 2012). In an attempt to counter part of the critiques, some residential youth care facilities offer gender-specific treatment to make treatment more attuned to the specific risks and needs of boys and girls. This development is based on the principle that girls have different risks and needs than boys (Handwerk et al., 2006; Nijhof, 2011; Sonderman et al., 2015; Weis et al., 2005), including differences in exposure to risk factors. Factors that mainly put girls at risk for problematic psychological development are,

for example, past victimization or traumatic experiences, destructive families and substance abuse (Anderson et al., 2019; Nijhof et al., 2018; Sonderman et al., 2015). Furthermore, girls tend to show more internalizing behavioral problems, such as depression and anxiety, at admission to SRC than boys (Handwerk et al., 2006). In addition, girls show more severe problems in the parent-child relationship and in other social relationships than boys (Nijhof et al., 2018). Lastly, girls referred to SRC suffer more frequently than boys from a (mild) intellectual disability than boys (Nijhof et al., 2018). Boys on the other hand show more severe substance abuse and problems with school and work than girls (Nijhof et al., 2018). Research also shows that girls are more sensitive to trauma and show more behavioral problems and depression afterwards than boys do (Nijhof et al., 2018). In addition, girls are also more sensitive to the protective effect of healthy social relationships than boys (Nijhof et al., 2018).

The development of gender-specific treatment is prompted by the risks, needs and responsivity (RNR) principles of Andrews and Bonta (2010). These principles state that to optimize the treatments' effectiveness (i.e. reducing behavioral problems, also through, for example, reducing trauma problems and the improvement of trauma problems and parenting skills) the treatment should match the risks and needs of the adolescents. Although more and more organizations pay attention to gender-specific treatment, we are still in the early stages of implementation. Several meta-analyses have shown that adolescents can benefit from treatment in a secure residential youth care facility (De Swart et al., 2012; Strijbosch et al., 2015), however research on the outcomes of gender-specific treatment is scarce. Therefore, whether organizations can improve outcomes for adolescents by offering tailored SRC is still unclear.

Some findings regarding characteristics of and outcomes for boys and girls in SRC are available. In 2006, Handwerk et al. showed that girls in SRC demonstrated higher rates of internalizing behavioral problems than boys at admission, but also a significantly greater reduction in those problems during treatment. Regarding SRC in The Netherlands,

improvement in behavioral problems was found in only 24% (Gevers et al., 2020) to 46% (Dirkse et al., 2018) of adolescent boys and girls. In both studies, no significant differences in effectiveness were found for boys and girls. Overall, this costly and autonomy limiting (Ryan & Deci, 2017) intervention shows poor results in terms of reducing behavioral problems, as shown by studies of Gevers et al. (2020) and Dirkse et al. (2018).

The present study

Despite the criticism about secure residential youth care, for some adolescents the intensity and protective context of SRC is inevitable (e.g., when foster care or less restrictive types of institutional youth care have failed, the immediate safety of the adolescents is at stake or the adolescent withdraws itself from the necessary care) (Ainsworth, 2017; Gutterswijk et al., 2020). For this reason, it is important to know if and how SRC can be effective in supporting positive psychological development of adolescents for whom other interventions are not considered suitable. Therefore, the aim of this study is to examine the effectiveness of two SRC facilities.

The first facility (called “Hestia”) offers gender-specific care for girls only. The second facility (called “Midgaard”) offers “regular” (i.e. non gender-specific) secure residential youth care (for more information, see Methods). To investigate whether gender-specific care is of added value for girls in SRC, we compare the effectiveness of (1) gender-specific care for girls to the effectiveness of “regular” care for girls. In addition, we compare the effectiveness of (2) “regular” care for girls to the effectiveness of “regular” care for boys. The following hypotheses were tested, on both the group and the individual level: (1) gender-specific SRC will result in greater improvements of girls’ externalizing and internalizing problem behavior, symptoms of PTSD, perceived competence, the parent-child relationship and parenting skills than “regular” SRC for girls, since gender-specific care is better tailored to the needs of girls than “regular” care, and (2) “regular” SRC for boys and girls results in greater improvements of externalizing

and internalizing problem behavior in boys than in girls, since this type of care is mainly based on knowledge about boys.

Methods

Participants

The study population consisted of 239 adolescents (aged 12-18 years) admitted to two secure residential youth care facilities in 2017, 2018, and 2019 in The Netherlands (called “Hestia” and “Midgaard”). By using convenience sampling, a total of 318 cases were examined for eligibility (see Figure 1). In total, 239 cases (75%) were included in this study (Girls from Hestia, $n = 59$; Girls from Midgaard, $n = 73$; Boys from Midgaard, $n = 107$) (for a brief description of the sample, see Table 1). In our sample, there were no adolescents who self-identified as non-binary or transgender. We therefore consider all participants as cis.

A minimum length of stay of six weeks was used as an inclusion criterium since the first six weeks of placement are considered as the stabilization and observation phase. After six weeks, in general, the more tailored treatment is started.

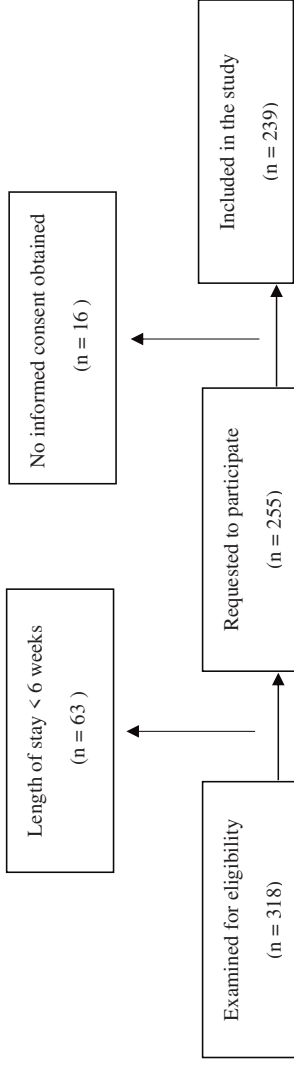


Figure 1. Flowchart showing how participants were selected

Table 1
Descriptives: Pre- and post-intervention and follow-up scores of all participants and percentages of adolescents with problems within the clinical range at admission

	Boys reg						Girls reg													
	M		SD		%		M		SD		%									
	N	T1	T2	T3	N	T1	T2	T3	N	T1	T2	T3								
Age at admission (yrs.)	15.59	1.44	15.59	1.41	15.57	1.30														
<i>Behavioral problems</i>																				
Internalizing behavioral problems ¹	83	3.76 (2.84)	38.6	27.56 (19.38)	46	3.22 (2.62)	49	4.63 (2.89)	53.1	42	5.02 (4.05)	29	4.45 (2.60)	47	4.34 (3.03)	42.6	25	3.28 (2.91)	13	3.00 (3.29)
Externalizing behavioral problems ¹	83	7.34 (3.64)	68.7	122.55 (28.86)	46	4.43 (3.38)	49	6.71 (3.29)	57.1	42	4.48 (3.11)	29	5.72 (3.68)	47	6.23 (3.57)	55.3	25	2.44 (2.76)	13	2.69 (1.75)
Internalizing behavioral problems ²	105	2.34 (2.72)	10.5	74.45 (20.55)	42	2.21 (2.70)	70	3.73 (3.22)	20.0	52	1.58 (2.44)	19	1.84 (1.61)	57	3.88 (2.71)	19.3	41	3.44 (3.01)	13	2.54 (2.93)
Externalizing behavioral problems ²	105	3.55 (2.52)	11.4	23.81 (5.58)	42	3.24 (2.24)	70	4.14 (2.54)	18.6	52	2.40 (2.38)	19	3.21 (2.64)	57	3.65 (2.25)	10.5	41	3.1 (2.44)	13	2.62 (1.85)
<i>Individual problems</i>																				
PTSD symptoms ²	99	17.38 (13.23)	20.2	27.56 (19.38)	41	27.56 (19.38)	64	29.11 (16.76)	50.0	49	18.31 (17.18)	20	23.70 (20.99)	56	28.09 (18.62)	46.4	37	23.76 (19.62)	12	24.83 (17.76)
Adaptive emotion regulation ²	89	128.21 (34.61)	22.5	133.18 (30.44)	46	122.73 (28.86)	62	122.73 (31.30)	29.0	49	125.33 (36.69)	17	116.71 (43.21)	49	123.06 (39.72)	30.6	37	120.68 (28.92)	10	107.60 (28.04)
Maladaptive emotion regulation ²	89	69.00 (18.92)	9.0	74.45 (20.55)	42	74.45 (20.55)	62	78.66 (23.09)	22.6	49	75.98 (19.40)	17	76.12 (17.81)	49	78.00 (20.68)	26.3	37	82.86 (21.24)	10	81.50 (33.51)
Perceived competence ²	98	30.14 (6.56)	2.0	29.26 (4.32)	43	23.81 (5.58)	66	26.56 (6.28)	4.5	50	27.40 (7.06)	21	22.38 (6.31)	50	24.48 (5.92)	12.0	38	27.16 (6.84)	13	26.54 (6.17)
<i>Family context</i>																				
Low quality parent-child relationship ²	75	13.79 (4.69)	50.7	11.07 (4.02)	46	11.07 (4.02)	46	11.70 (4.41)	30.4	41	11.61 (4.79)	29	13.17 (3.81)	41	10.73 (4.24)	24.4	23	11.87 (5.04)	13	8.77 (2.86)
Insufficient parenting skills ¹	75	18.40 (4.41)	58.7	15.13 (4.78)	46	15.53 (4.76)	46	15.98 (4.53)	37.0	41	15.80 (4.93)	30	16.73 (4.23)	42	16.33 (4.46)	38.1	23	15.74 (4.98)	13	12.38 (3.78)

Note 1. Boys reg, boys in regular RC; Girls reg, girls in regular RC; Girls gen, girls in gender-specific RC.

Note 2. The table shows the percentages of boys and girls with problems within the clinical range, based on the cut-off scores of the instruments.

¹ Parent-report

² Adolescent-report

Settings

Hestia is a gender-specific (“girls-only”) facility offering treatment to vulnerable girls who are, for example, victims of commercial sexual exploitation, excluding girls exhibiting severe externalizing problem behavior or girls who are being known for recruiting girls for commercial sexual exploitation. A trauma-sensitive approach is used. Screening for PTSD-symptoms is part of any treatment pathway and trauma therapy is deemed necessary in almost all cases. *Midgaard* offers “regular” help to the other girls (and boys) who are referred to SRC. The term “regular” is only used to indicate that the help at *Midgaard* is *non-gender specific* help. In Table 2 the main characteristics of both SRC facilities are presented. Both facilities exclude adolescents who show a (mild) intellectual disability or (serious) psychiatric problems that are so severe that treatment in SRC impossible. In order to receive treatment, the adolescents live in secure residential 24-h care in a living group with a highly structured daily routine. Within six weeks after admission, a treatment plan is established, under supervision of a behavioral scientist, in collaboration between the adolescent and his professional and social network. Furthermore, a family counselor is appointed when problems were identified in the family context and in both settings, sociotherapists try to achieve a positive living group climate to optimize treatment results (Van der Helm et al., 2018). Moreover, additional individual therapy (e.g., trauma therapy or family therapy) is offered when indicated by a behavioral scientist or psychiatrist. Lastly, for some of the adolescents, pharmacotherapy is used for the treatment of, for example, ADHD, depression or sleep problems.

Table 2
Key criteria of the two settings

	Regular SRC (" <i>Midgaard</i> ")	"Gender-specific" SRC (" <i>Hestia</i> ")
<i>Facility</i>		
Capacity	60	30
Gender	Boys and girls	Girls
<i>Living group</i>		
Number of adolescents per living group	8 to 10	8 to 10
Number of sociotherapists per living group	2 to 3	2 to 3
<i>Treatment</i>		
Main treatment goals	Reducing behavioral problems, improving parenting skills, improving emotion regulation	Reducing behavioral problems, improving parenting skills, improving emotion regulation, preventing revictimization, improving empowerment, reducing PTSD symptoms
Treatment approach	Solution-oriented approach, system-oriented approach, cognitive behavioral approach, presence approach, social competence model, positive working alliance, shared decision making, informal mentoring, motivational interviewing, positive living group climate	As regular SRC and in addition: trauma-sensitive approach, social network analysis, family therapist involved in every case, psychomotor group therapy, workshops on healthy relationships, sexuality and intimacy.
Individual therapy (e.g., trauma therapy, family therapy, psychomotor therapy)	56% of adolescents received individual therapy	90% of adolescents received individual therapy
Average length of stay	203 days	202 days

Procedure

Within three weeks after admission, research assistants provided parents and adolescents with a paper version of the questionnaires, either at home or in the institution. Furthermore, a written informed consent was obtained from the adolescents and their parents (or legal guardians). The questionnaires were filled out at admission (T1), at discharge (T2) (range = 43 to 636 days after admission), and at follow-up (T3) (six months after discharge) by a biological parent (in some cases substituted by a legal guardian) and the adolescents themselves. The response rate for the measurement at admission was 89% for adolescents and 68% for parents; at discharge 61% for adolescents and 53% for parents; and at follow-up 31% and 35% respectively. During the filling-out of the questionnaires the researcher remained within reach of the informant to offer help when/if necessary. The data was pseudonymized before processing, according to the guidelines of the medical ethical review committee. After submitting the research proposal to the medical ethical review committee, we were exempt from the reviewing process (TWOR – 2018-24).

Measures

Externalizing and internalizing problem behavior. The Dutch versions of the *Brief Problem Monitor Parent-version* (BPM-P) and the *Brief problem Monitor Youth-version* (BPM-Y) (Verhulst, Van der Ende, & Hoolhans, 1996) were used to identify psychosocial problems, and were filled out by parents or substitute caregivers and by the adolescents themselves. Two scales of the BPM's (19 items) are used in this study: "externalizing problem behavior" (7 items), and "internalizing problem behavior" (6 items). Answers are given on a three-point scale (0 = *not true*, 1 = *sometimes true* and 2 = *very true*).

Symptoms of post-traumatic stress disorder. The *Children's Revised Impact of Event Scale* (CRIES-13) (Verlinden & Lindauer, 2015) screens for signs of post-traumatic stress disorder (PTSD). The instrument (13 items) is used to ask the adolescent what impact a certain stressful event has had on his well-being the past seven days. The answers are given on a four-point scale (0 = *never*, 1 = *rarely*, 3 = *sometimes* and 5 = *often*) (Verlinden & Lindauer, 2015).

Perceived competence. Adolescents rated the subscale "intrapersonal empowerment" (8 items) of the *Empowerment questionnaire* (EMPO 3.1) (Damen et al., 2017), to measure perceived competence. The answers are given on a five-point Likert-scale (1 = *totally disagree*, 2 = *disagree*, 3 = *do not agree/do not disagree*, 4 = *agree*, and 5 = *totally agree*).

Parent-child relationship and parenting problems. The *Parenting Stress Questionnaire* (OBVL) (Veerman et al., 2014) is a self-report questionnaire (34 items), filled out by parents, and measures the stress parents can experience in the upbringing of their children. The questions can be answered on a 4-point-scale (1 = *doesn't apply*, 2 = *applies a little*, 3 = *applies fairly* and 4 = *applies completely*). In the present study we used the subscales "parent-child relationship" (6 items) and "parenting problems" (7 items).

Emotion regulation. The FEEL-KJ (FEEL-children and adolescents; Grob & Smolenski, 2013) (90 items) is an instrument to measure emotion regulation and is filled out by the

adolescents themselves. The possible answers are “Almost never”, “rarely”, “occasionally”, “often”, and “almost always”. We used two subscales of the instrument: “adaptive strategies” (42 items) and “maladaptive strategies” (30 items).

For further information about the measures, see the online appendix.

Data analysis

The Statistical Package for the Social Sciences (SPSS version 25, IBM, Armonk, NY, USA) was used to test for overall differences over time, between girls in gender-specific care and girls in regular care and between boys and girls in regular SRC, using both an overall multivariate analysis of covariance (MANCOVA) on all outcome measures (with age as a covariate), as well as separate bootstrapped ANCOVA's and bootstrapped planned contrasts for individual outcome measures (with age as a covariate). The independent variable was the treatment group (“Girls Hestia”, “Girls Midgaard” and “Boys Midgaard”) and the dependent variables were problem behavior, symptoms of PTSD, adaptive and maladaptive emotion regulation, perceived competence, the parent-child relationship and parenting skills. We first tested for a general multivariate effect on T2-T1 difference scores for the subset of cases with complete T1-T2 data on all outcome variables, using listwise deletion. Then, conditional upon this multivariate test, we performed separate univariate tests on the larger set of all available T2-T1 difference scores for all outcomes. Given the amount and distribution of missing data, we opted for a dual approach of reporting both a follow-up analysis on all available T1-T2 data, as well as an analysis using smaller restricted sample consistent with our initial multivariate analysis. For any significant outcome, we then tested bootstrapped simple contrasts on T2-T1 difference scores for girls in regular *vs* gender-specific care, and for boys *vs* girls in regular care. Finally, for any consistently significant pattern of group differences on T2-T1 difference scores, we then performed bootstrapped simple contrasts on T3-T1 difference scores to explore whether the group differences were still present at T3.

To test whether the complete vs missing data both revealed a significant T1-T2 decrease which are comparable in magnitude, we split our dataset into two non-overlapping sets: a set of cases that was complete (i.e., both T1 and T2 were present), and a set of cases that contained missing data (i.e., either T1 or T2 were present but not both).

In addition, significant change at the individual level in the different outcome measures was examined using the Jacobsen-Truax Reliable Change Index (RCI) (Jacobsen et al., 1999). The RCI allows to determine whether change from pretreatment to discharge, and from pretreatment to follow-up is not the result of random measurement error. Accordingly, difference scores that were possibly due to random measurement error were classified as ‘no change’. Difference scores that were not the possible result of random measurement error were classified as ‘improvement’ or ‘deterioration’.

Results

Missing data analysis and group comparisons at baseline (T1)

For an overview of our missing data analysis and group comparisons at baseline, see the supplementary online appendix.

Given the percentages of missing data, their distribution across conditions and time, and the observed differences at baseline, we decided not to impute missing values. Instead, we decided to set up a conservative conditional sequence of statistical tests on the available cases – given the restrictions imposed by the pattern of missing data – that aimed to preclude Type-I errors while still allowing to test planned contrasts between the intervention conditions.

Differences in psychosocial development between girls in gender-specific care and girls and boys in regular care

Group comparisons over time (T1-T2)

A MANCOVA with age and all outcomes at baseline (T1) as covariates (boys regular care $n = 20$, girls in regular care $n = 11$, and girls in gender-specific care $n = 15$), indicated that

the three treatment groups differed in their T2-T1 difference scores ($F(20,46) = 1.85, p < .05$, Wilk's $\Lambda = 0.307$, partial $\eta^2 = .46$).

Separate univariate tests on all available data indicated that the multivariate effect was driven by the externalizing behavioral problems reported by parents: an ANCOVA with age and baseline (T1) as covariates (boys regular care $n = 54$, girls in regular care $n = 26$, and girls in gender-specific care $n = 24$), indicated that the three treatment groups differed in their T2-T1 slopes ($F(2,100) = 4.36, p < .05$, partial $\eta^2 = .08$). This effect is mathematically equivalent to an ANCOVA with age and baseline outcome score (T1) as covariates and T2 scores as the outcome). Given that the overall multivariate test included a subset of participants included in the univariate follow-ups (due to missing data), we additionally ran the univariate tests using the identical subset included in the initial MANCOVA (boys regular care $n = 20$, girls in regular care $n = 11$, and girls in gender specific care $n = 15$). Here we also only observed a significant effect for parent-reported externalizing behavioral problems (see Note 1). No other univariate tests were significant.

Corroborating the univariate test, follow-up bootstrapped simple contrasts revealed that the T2-T1 difference scores for externalizing behavioral problems reported by parents were significantly larger for girls in gender-specific care vs regular care ($b = -2.36, SE_b = 0.81$, BCa 95% CI [-3.86, -0.97]). The possibility of limited statistical power precludes strong conclusions, however, the findings seem to indicate a significantly larger decrease of externalizing problem behavior in girls in gender-specific care vs regular care. No significant difference was observed for girls vs boys in regular care ($b = -0.64, SE_b = 0.73$, BCa 95% CI [-2.01, 0.64]). Bootstrapped tests on the estimated marginal means indicated that all three treatment groups demonstrated significant decreases in externalizing behavioral problems reported by parents from T1 to T2 (girls in gender-specific care: $M_{T2-T1} = -4.34, SE_{M_{T2-T1}} = 0.64$, BCa 95% CI [-5.58, -3.06]; girls

in regular care: $M_{T2-T1} = -2.62$, $SE_{MT2-T1} = 0.55$, BCa 95% CI [-3.68, -1.59]; boys in regular care: $M_{T2-T1} = -1.98$, $SE_{MT2-T1} = 0.73$, BCa 95% CI [-3.52, -0.21]).

Given the consistent differences in T1-T2 slopes *between* treatment groups, combined with interpretable non-zero T1-T2 slopes *within* each treatment group, we decided to explore whether the pattern of results would still be observable at T3, 6 months after T2. Bootstrapped simple contrasts indicated that the T3-T1 decreases for externalizing behavioral problems reported by parents (boys regular care $n = 32$, girls in regular care $n = 22$, and girls in gender-specific care $n = 13$), were relatively larger for girls in gender-specific care vs regular care ($b = -2.43$, $SE_b = 0.96$, BCa 95% CI [-4.65, -0.40]). Here, we again observed the same pattern using the subset of subjects included in the initial MANCOVA (see Note 2). No significant difference was observed for girls vs boys in regular care ($b = -0.40$, $SE_b = 0.99$, BCa 95% CI [-2.32, 1.47]). Bootstrapped tests on the estimated marginal means indicated that the girls in gender-specific care and girls in regular care, but not boys in regular care, showed significant decreases in externalizing behavioral problems reported by parents from T1 to T3 (girls in gender-specific care: $M_{T2-T1} = -3.65$, $SE_{MT2-T1} = 0.72$, BCa 95% CI [-5.08, -2.21]; girls in regular care: $M_{T2-T1} = -1.62$, $SE_{MT2-T1} = 0.73$, BCa 95% CI [-3.02, -0.23]; boys in regular care: $M_{T2-T1} = -1.22$, $SE_{MT2-T1} = 0.81$, BCa 95% CI [-2.66, 0.24]). In sum, we observed a larger decrease in parent-reported externalizing behavior from T1 to T2 for girls in gender-specific care, which persisted to T3 (see Figure 2). Unfortunately, due to the combination of both large drop-out rates and late-inclusions, there were insufficient cases available to analyze treatment effects on externalizing behavior per time point, as a function of missing status.

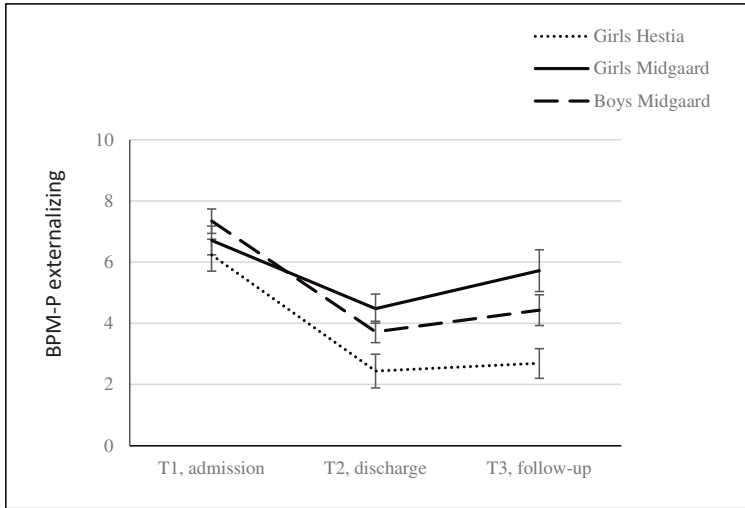


Figure 2. Estimated marginal means of externalizing behavioral problems reported by parents by Condition and Time. Error bars represent standard errors of the means. (T1-T2: boys regular care $n = 54$, girls in regular care $n = 26$, and girls in gender-specific care $n = 24$, T3: boys regular care $n = 32$, girls in regular care $n = 22$, and girls in gender-specific care $n = 13$)

Although we observed consistent results over different subsets of the available data (multivariate and univariate analyses on T1-T2 with $n = 46$, univariate analyses on T1-T2 with $n = 104$, univariate analyses on T1-T3 with $n = 67$), an important question is whether our results may be spuriously due to selection biases (see Note 3). To reiterate, we observed that treatment conditions were not associated with missing status on T1-T2 difference scores in externalizing behavior (see Section 3.1), precluding a selection bias relating to the presence *vs* absence of data. However, we additionally tested whether the complete *vs* missing data both showed a significant T1-T2 decrease which are comparable in magnitude. As expected, a bootstrapped within-subject T-test on the complete set ($n = 104$) indicated a significant T1-T2 decrease in parent-reported externalizing behavior ($M_{T2-T1} = -2.86$, $SE_{MT2-T1} = 0.47$, BCa 95% CI [-3.81, -1.91]). More importantly, a bootstrapped between-subjects T-test on the set containing missing data (only T1 present with $n = 75$, only T2 present with $n = 31$) also revealed a significant T1-T2 decrease which was comparable in magnitude ($M_{T2-T1} = -3.70$, $SE_{MT2-T1} = 0.47$, BCa 95% CI

[-4.96, -2.42]), suggesting that missing status did not have a strong influence on the T1-T2 decrease observed in parent-reported externalizing behavior (see Figure 3).

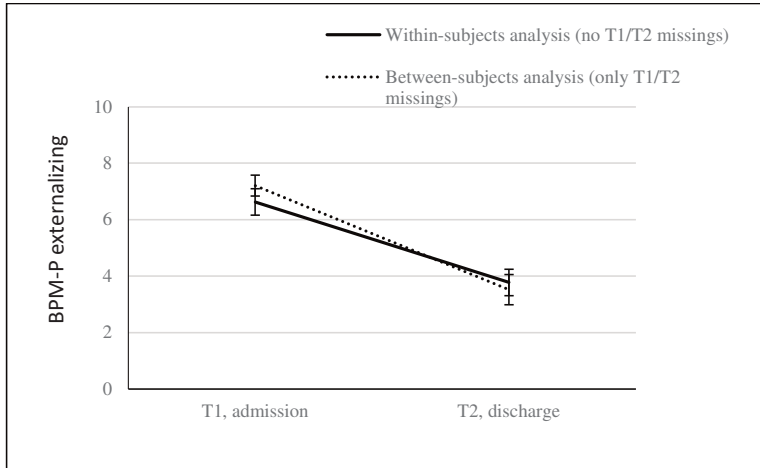


Figure 3. Estimated marginal means of externalizing behavioral problems reported by parents for Cases without missings vs cases with missings and Time. Error bars represent standard errors of the means (within-subjects $n = 104$, between-subjects T1: $n = 75$, T2: $n = 31$).

Results at the individual level

To examine to what extent significant psychosocial development over time occurred at the individual level, the RCI was calculated for all outcome measures using the scores on T1. The development of the adolescents could be classified as an improvement, no change or a deterioration (see Table 3).

Table 3
Results: Outcomes of all participants based on RCI

	Boys reg TI-T2			Boys reg TI-T3			Girls reg TI-T2			Girls reg TI-T3			Girls gen TI-T2			Girls gen TI-T3		
	N	Improved	Deteriorated	N	Improved	Deteriorated	N	Improved	Deteriorated	N	Improved	Deteriorated	N	Improved	Deteriorated	N	Improved	Deteriorated
<i>Behavioral problems</i>																		
Internalizing (parent-report) ¹	54	12 (22%)	21 (39%)	41	41 (27%)	11 (49%)	26	9 (35%)	9 (35%)	18	7 (30%)	8 (30%)	24	9 (37%)	6 (27%)	11	4 (36%)	5 (21%)
Externalizing (parent-report) ¹	54	27 (50%)	22 (41%)	32	12 (38%)	12 (38%)	26	10 (39%)	12 (46%)	21	8 (38%)	4 (15%)	24	14 (58%)	4 (19%)	13	5 (38%)	1 (4%)
Internalizing (adolescent-report) ²	66	21 (32%)	32 (48%)	41	11 (27%)	20 (49%)	49	28 (57%)	16 (33%)	17	12 (70%)	5 (10%)	40	14 (35%)	2 (12%)	14	6 (43%)	11 (28%)
Externalizing (adolescent-report) ²	66	23 (35%)	24 (37%)	41	15 (37%)	11 (26%)	49	28 (57%)	12 (25%)	18	9 (50%)	9 (18%)	40	9 (23%)	6 (33%)	12	5 (42%)	8 (20%)
<i>Individual problems</i>																		
PTSD symptoms ²	58	12 (21%)	25 (43%)	38	4 (11%)	16 (42%)	41	18 (44%)	15 (37%)	16	7 (44%)	8 (19%)	37	7 (19%)	4 (25%)	12	3 (25%)	6 (16%)
Adaptive emotion regulation ²	56	13 (23%)	28 (50%)	32	6 (19%)	14 (43%)	40	12 (30%)	18 (45%)	15	4 (27%)	10 (25%)	34	5 (15%)	5 (33%)	9	3 (33%)	6 (18%)
Maladaptive emotion regulation ²	56	6 (11%)	36 (64%)	36	5 (14%)	23 (64%)	40	8 (20%)	23 (57%)	13	5 (38%)	9 (23%)	34	0 (0%)	1 (8%)	10	0 (0%)	4 (12%)
Perceived competence ²	59	6 (10%)	46 (78%)	38	2 (5%)	11 (29%)	44	7 (16%)	32 (73%)	18	3 (17%)	5 (11%)	37	8 (22%)	7 (39%)	13	2 (15%)	0 (0%)
<i>Family context</i>																		
Low quality parent-child relationship ¹	42	13 (31%)	22 (52%)	30	10 (33%)	16 (53%)	22	3 (13%)	15 (68%)	18	5 (28%)	4 (18%)	20	3 (15%)	5 (28%)	13	1 (8%)	4 (20%)
Insufficient parenting skills ¹	42	13 (31%)	21 (50%)	30	7 (23%)	19 (63%)	22	3 (13%)	15 (68%)	20	3 (15%)	4 (18%)	20	4 (20%)	3 (15%)	13	4 (31%)	2 (10%)

Note. Boys reg. boys in regular RC; Girls reg. girls in regular RC; Girls gen. girls in gender-specific RC.

¹ Parent-report

² Adolescent-report

We found an improvement of behavioral problems ranging from 22% (Internalizing behavioral problems – parent report – boys in regular care – T1-T2) to 70% (Internalizing behavioral problems – adolescent report – girls in regular care – T1-T3). Additionally, depending on the intervention, the time of measurement and the informant, up to 74% of adolescents who displayed behavioral problems within the clinical range at admission failed to improve during their stay and after discharge. The parent reports seem to indicate that more girls in gender-specific care experience a decrease of their externalizing problem behavior at discharge than girls in regular care do (58 vs 38%). However, the adolescent reports seem to indicate the opposite (improvement in 57% of girls in regular care vs 23% of girls in gender-specific care). No difference in the decreases of internalizing problems was found based on parent report, however, based on the self-reports, 57% of girls in regular care seem to make progression with regard to their internalizing problem behavior, against 35% of girls in gender-specific care. Overall, a decrease of problem behavior was mainly seen in adolescents who had clinical scores at the time of intake, and an increase was particularly visible in adolescents who had non-clinical scores at admission.

Furthermore, PTSD-symptoms decreased mainly in girls of “Midgaard”. According to the self-reports on T1 and T2, progress was achieved in 44% of the trajectories, against 21% (boys “Midgaard”) and 19% (girls “Hestia”). No progress or deterioration was seen in 17% (girls “Midgaard”) to 62% (girls “Hestia”) of the adolescents who displayed PTSD-symptoms at admission.

Regarding emotion regulation, improvement rates ranged from 0% (Maladaptive emotion regulation – girls in gender-specific care – T1-T2 and T1-T3) to 38% (Maladaptive emotion regulation – girls in regular care – T1-T3). For the adolescents who reported problems in their emotion regulation, the percentages of improvement range from 0% (Maladaptive

emotion-regulation – girls “Hestia” – T1-T2) to 80% (Adaptive emotion-regulation – boys “Midgaard” – T1-T2).

Progression rates are relatively low regarding perceived competence, with percentages ranging from 5% (boys in regular care – T1-T3) to 22% (girls in gender-specific care – T1-T2). Adolescents who displayed alarming levels of perceived competence at the time of admission failed to make progress in 17% (girls “Midgaard” – T1-T2) to 82% (boys “Midgaard” – T1-T2) of the cases.

Lastly, regarding the quality of the relationship between parents and adolescents, 13% to 31% of the families experienced progress, between admission and discharge. In more detail, for parents who reported a problematic parent-child relationship at admission, progress was seen in 27% (girls in regular care – T1-T2) to 63% (girls in regular care – T1-T3) of the families. These findings indicate that girls in regular care seem to continue to make progress after discharge in the perception of their parent(s). Improvement of the parenting skills between admission and discharge varies over the different settings and ranges from 13% of the cases for girls in “Midgaard” to 31% of the cases of boys in “Midgaard”. Moreover, progression was seen in 23% (girls in regular care – T1-T2) to 67% (girls in gender-specific care – T1-T3) of the parents who reported insufficient parenting skills at the time of admission.

Discussion

The present study compared the effectiveness of two types of SRC for three groups of adolescents: girls in gender-specific care, girls in regular care, and boys in regular care. We first hypothesized that gender-specific SRC, which is adjusted to the specific needs of girls, would result in greater improvements in girls’ externalizing and internalizing problem behavior, symptoms of PTSD, perceived competence, parent-child relationships, and parenting skills than regular SRC for girls. However, we only found a statistically significant larger decrease of parent-reported externalizing problem behavior for girls in gender-specific care than for girls

in regular care, which might indicate that gender-specific care is indeed better suited to the needs of girls. Another possible explanation is the risk of adolescents reinforcing one another's deviant behaviors (Souverein et al., 2013; Weis et al., 2005). Girls in regular care live together with boys, showing more externalizing problem behavior than girls, making it likely that the risk of "deviancy training" reinforcing externalizing problem behavior is greater for girls in regular care than for girls in gender-specific care. For all other outcomes the intervention effects of both SRC types are similar. A possible explanation for this finding is that adolescent characteristics (e.g., previous care trajectories) or treatment characteristics (e.g., working alliance and living group climate) (Ayotte et al., 2016; Sonderman et al., 2015) outside the scope of this study may also be (partially) predictive of the outcomes. Furthermore, the parents of the girls in gender-specific care were likelier to be involved in treatment than the parents in regular care, possibly influencing their views of their children's problems. Lastly, due to the possibility of limited statistical power of our analyses, we used conservative statistical methods. This can also serve as a possible explanation for the absence of other statistically differences in the treatment outcomes of boys and girls.

Parents also reported that, on an individual level, girls in gender-specific care demonstrated the largest decrease in behavioral problems at discharge. Nevertheless, there was no difference six months after discharge. In contrast, girls in regular care achieved the most progress in overcoming externalizing behavioral problems from admission to discharge, according to their self-reports. This difference was much less apparent six months after discharge. We believe there are several possible explanations for the results being different at discharge than at follow-up. First, the number of subjects that could be reached during the follow-up was significantly lower than the number at the time of discharge. This finding increases the risk of selection bias if one assumes that respondents with successful outcomes are more easily reached. Another possible explanation is adolescents showing relapse. The fact

that Hestia's intervention invests more in aftercare can partly explain the self-reporting of more positive results in terms of externalizing problem behavior in Hestia girls at follow-up than at discharge. Lastly, the treatment adolescents receive after discharge from SRC was not taken into account in this study. The differing treatments among adolescents can explain individual differences at follow-up. The results found are similar to relatively positive compared to the findings by Gevers et al. (2020) and Dirkse et al. (2018), who found a decrease of internalizing and externalizing problems in 22 to 46% of the adolescents studied in SRC. However, although a significant part of the population shows improvement in their behavioral problems, an even larger part shows no significant change or even deterioration. These results are alarming, since these adolescents, to make the treatment possible, are placed out of their homes, into a very intensive, restrictive and expensive type of care. These findings confirm that part of the population may suffer from the iatrogenic effects critics warn about. Some of the possible causes for iatrogenic effect mentioned by Van IJzendoorn et al. (2020) and Souverein et al. (2013) are coercion and repression exhibited by care professionals, violence amongst the adolescents themselves or re-traumatization.

A clear difference between the groups in our study can also be seen with regard to family problems at the time of follow-up. Here, too, the girls in gender-specific care in most cases improved. In Nijhof's study (2011), parents reported no improvement in family functioning; however, they did report a significant decrease in parenting stress. Second, we hypothesized that regular SRC for boys and girls would result in greater improvement in externalizing and internalizing problem behavior in boys than in girls. However, in contrast to our expectations, we found no significant differences in improvements between boys and girls in regular care at the group level. This finding might imply that the interventional effects of SRC are similar for boys and girls, which could refute the common belief that regular SRC is only effective for treating boys. It is in line with the observation by Griffith et al. (2009) that boys and girls show

similar outcomes when leaving residential care, for example, similar behavioral and familial outcomes, and with the findings by Handwerk et al. (2006) noting improvements in the problem behavior of boys and girls during residential treatment. In contrast to our findings, these researchers found greater improvement in internalizing problem behavior in girls than in boys. A possible explanation for not finding a significant difference in effectiveness for boys vs girls can be found in the perception of the living group climate. A positive living group climate, especially the safety experienced by the adolescents, enhances the interventions' effectiveness (Eltink et al., 2020). Since girls perceive the living group climate more negative than boys do (Sonderman et al., 2015), this may limit the interventions effectiveness for girls. On an individual level, girls self-reported a larger decrease in externalizing problem behavior than boys as well as in internalizing problems. Parents reported fewer differences in improvement. Boys showed a greater decrease in externalizing problem behavior than girls, while girls showed a greater decrease in internalizing problem behavior than boys. It was striking that progress in externalizing as well as internalizing problem behavior was mainly made by adolescents who had a clinical score at the time of intake and that an increase was particularly visible in adolescents who scored in the normal range at the time of intake. This finding, however, can be caused by what is known as 'regression toward the mean', the phenomenon that if one sample of a variable is extreme, the next sampling of the same variable is likely to be closer to its mean. Accordingly, this finding must be interpreted with caution. We believe a possible explanation for the increase in behavioral problems among these adolescents is deviancy training (Souverein et al., 2013) and the restriction of autonomy (Ryan & Deci, 2017; Van IJzendoorn et al., 2020).

Regarding PTSD symptoms, no significant differences in improvement were found on the group level. However, on the individual level PTSD symptoms seemed to decrease mainly in girls of Midgaard. This is noteworthy since it contradicts expectations, as a trauma sensitive

approach is used in Hestia. Possible explanations for these findings are that, although the level of PTSD symptoms was similar for girls in both Midgaard and Hestia, trauma issues in girls of Hestia may have been more complex. In addition, although re-traumatization in Hestia is prevented as much as possible, treatment of trauma may initially exacerbate the severity of the symptoms, before they eventually decrease.

Another important finding of our study is that although 22% to 58% of the adolescents showed a decrease in behavioral problems during their stay in SRC, most showed no significant change between admission and discharge or follow-up for PTSD symptoms, perceived competence, emotion regulation, and family problems. This finding can partly be explained by the surprising fact that most adolescents had a nonclinical score for PTSD symptoms (69%) and perceived competence (95%) at admission. We also found a non-clinical score at admission in the majority of the adolescents for parent–child relationships (62%), parenting skills (63%), adaptive emotion regulation (73%), and maladaptive emotion regulation (84%) (see Table 2). Since these results are based on self-reports, it is possible that both adolescents and parents answered the questionnaires to make their situation at admission appear more positive than it actually was. However, as these adolescents show deterioration of their problems or no significant improvement, it seems that for a large proportion of adolescents SRC is not appropriate and even harmful. Improving knowledge about for whom SRC is (not) appropriate is necessary. Furthermore, extensive screening before referral is crucial.

With regard to the possible iatrogenic effects of SRC, deterioration of externalizing problem behavior was observed in 4% to 15% of the cases (parent-reported), and in 18% to 20% of the cases (self-reported). Gevers et al. (2020) study in open and secure residential care found deterioration of externalizing problems ranging from 8% (self-reports) to 13% (parent reports) among adolescents. Furthermore, we found a deterioration of internalizing problems among 10% to 31% of the adolescents, compared to 6% found by Gevers et al. (2020). A study

by Dirkse et al. (2018) revealed that a total of 32% of adolescents deteriorated in their total problem behavior, as reported by their parents and sociotherapists. Overall, in relation to these previous studies, our findings on deterioration seem comparable and positive. In addition, a large part of the population shows no significant change in their problems (i.e., 25% of girls in regular care regarding externalizing problem behavior, up to 88% of girls in gender-specific care regarding maladaptive emotion regulation). Whereas these findings can partly be explained by the fact that some of these girls had no problems in this area at admission, it is again alarming that, despite the provision of highly specialized care, improvement is not achieved in a significant part of the population.

Limitations

Due to the relatively small sample size, some of our study's analyses may have suffered from limited statistical power, in particular the MANCOVA. Accordingly, we used conservative statistical methods, which may have reduced the chances of finding statistically significant differences but increased the meaningfulness of the findings. Although the sample size at discharge was sufficient, the sample size for the follow-up measurements was relatively small. While this small sample size reduced the meaningfulness of the findings, these findings are valuable because adolescents from SRC's are difficult to reach for participation in longitudinal research, especially with regard to follow-up measurements. Another limitation resulting from this relatively small sample size is that it was impossible in the analyses to distinguish between adolescents with clinical pretest scores and those with nonclinical pretest scores. Furthermore, it was not possible to analyze the measurements at T1-T2-T3 together in one analysis, due to limited sample size. A second limitation is caused by using convenience sampling. Due to the lack of random assignment, initial differences between girls from "Hestia", girls from "Midgaard" and/or boys from "Midgaard" can, as confounding variables, cause a threat to internal validity. For example, some girls of "Hestia" were victims of

commercial sexual exploitation, whilst girls from “Midgaard” were not. The third limitation we would like to mention is that in the present study we tried to determine the potential added value of gender-specific care for girls, compared to regular SRC, by examining girls who stayed in a girls-only care facility, that uses a gender-specific care approach. Therefore, it is not possible to conclude whether this added value can be attributed to the fact that girls are treated without boys or to the substantially different, i.e., gender-specific, care approach. The final limitation of this study we would like to mention is that the level of treatment integrity and living group climate in the facilities were not part of this study. As we mention elsewhere in the discussion, both treatment integrity and living group climate can serve as a possible explanation for similarities and differences found in effectiveness of regular and gender-specific treatment.

Implications for clinical practice and future research

Since previous research has shown that adolescents with externalizing rather than internalizing behavioral problems progress the most during their stay in SRC, and the findings in the present study emphasize that adolescents with the most severe behavioral problems improve during treatment, the accurate screening of problems prior to referring adolescents to SRC is essential. The information gathered should then be used to tailor treatment to adolescent’s risks and needs. Furthermore, the screening should be used to prevent adolescents who fail to improve during placement in SRC from entering this type of care. Alternative interventions have proven to be unsuitable for some adolescents, given the fact that most adolescents entering SRC have experienced failure during ambulatory care, foster care and residential care, and have lost their faith in and motivation for treatment. SRC is therefore mostly seen as a last resort. However, since these adolescents also fail to improve in SRC or even show deterioration, our findings underline the need for developing suitable alternative interventions that can guarantee the safety of the adolescents and prevent them from withdrawing themselves from the necessary care. In addition, less restrictive types of care,

preferably family-style care, should be the first option of choice when children are not able to live at home. Especially Treatment Foster Care Oregon for Adolescents (TFCO-A) shows promising results (Gutterswijk et al., 2020). Furthermore, a first exploration of small-scale residential care shows promising results as well. Professionals in these settings are able to establish a more positive working alliance with both adolescents and their parents and provided a more positive living group climate. Moreover, adolescents experience a more positive relationship with each other in small-scale residential care compared to regular care, feeling safer to express themselves (Nijhof et al., 2020). These types of care should be accompanied by effective family interventions, especially used to improve parenting skills of parents (Eltink et al., 2017; Martin et al., 2017).

Our findings seem to indicate that girls in gender-specific SRC develop more positively in terms of externalizing problem behavior, but not in other outcomes. Although diminishing externalizing problem behavior is the main goal of SRC (Ainsworth, 2017), it remains noteworthy that girls in gender-specific care develop similarly to girls in regular care in regard to PTSD symptoms, perceived competence, and family problems. This finding is remarkable, as the former type of care prioritizes the treatment of trauma and insufficient perceived competence. As previously mentioned, differences in, for example, working alliance (Ayotte et al., 2016), living group climate (Sonderman et al., 2015), or even lack of treatment integrity can serve as a possible explanation. Furthermore, it is conceivable that the girls in both settings differ from each other in terms of characteristics (e.g., treatment motivation, previous received care, adverse childhood experiences) (Olver et al., 2011). However, previous research has shown that the girls from both facilities on average do not differ in the problems they experience at admission (i.e., internalizing and externalizing behavioral problems, PTSD symptoms, emotion regulation, perceived competence, parenting skills and the quality of parent-child relationships) (First author et al., under review). Another possible reason for the lack of

differences is the treatment itself. Although gender-specific care places higher priority on trauma and family treatment than regular care does, facilities providing a regular approach may also offer trauma and family treatment when indicated. The professionals at Midgaard could be successful of tailoring treatment to meet the needs and risks of the adolescents they treat.

Furthermore, our findings support the presence of iatrogenic effects. Most of the adolescents in our sample were referred to SRC because of behavioral problems. However, based on parent reports, 7.0% of the adolescents had neither externalizing nor internalizing problems in the clinical range at admission. It is unlikely that SRC is the appropriate type of care for these adolescents because deterioration of problem behavior was found in these adolescents in particular. To minimize iatrogenic effects, it is important to match the intervention to the risks and needs of adolescents to improve the effectiveness of the intervention (cf. Andrews & Bonta, 2010) and work on a therapeutic residential group climate (Van der Helm et al., 2018).

Our dataset suffered from many missing values and our sample was relatively small, limiting statistical power. This reduced the chances of finding statistically significant differences. To prevent respondents dropping out during the study we recommend using a more ‘wraparound’ approach, where the measurements are an integral part of the care. Furthermore, to increase the sample size, in future research data should be collected at more SRC institutions. The length of stay of the adolescents in our sample varied greatly (range = 43 to 636 days). Since the policy in The Netherlands is to ensure that the duration of the placement is as brief as possible, and scientific evidence shows conflicting results for the ideal duration of treatment (Strijbosch et al., 2015; Van IJzendoorn et al., 2020), it is important to investigate in future research whether placements in (secure) residential youth care with a duration of over six months are justified. Another recommendation is to use a repeated measures design to study the

development of adolescents during treatment. Using repeated measurements makes it possible to study the link between behavioral change and the length of stay.

Conclusion

In an attempt to better match the content of SRC to the risks and needs of adolescent girls, gender-specific care has been developed in recent years. The findings of this study only partially support the importance of gender-specific care. Adolescent girls in gender specific SRC do develop more positively during their stay, since their externalizing behavioral problems show a significantly stronger decrease than the externalizing behavioral problems of girls in regular care. However, internalizing behavioral problems, PTSD-symptoms and perceived competence emphasized by the gender-specific approach, show a comparable progress in both gender-specific and regular care. Furthermore, our findings seem to not confirm the criticism that regular care is more suitable for boys. Boys do not develop significantly better in regular care than girls do. Nevertheless, our study confirms an important part of the criticism, that a significant proportion of adolescents fail to show improvement in their problems, and some even deterioration. Despite its intensity and costs, SRC fails to achieve convincing results. Most adolescents fail to show a positive development in their behavioral problems. Organizations should do everything within their power to prevent adolescents, for whom SRC is not appropriate, to be referred to SRC. In addition, the development of alternative interventions is highly necessary. Regarding this development, small-scale residential care and TFCO-A show promising results.

Notes

1. Univariate tests using the identical subset of subjects included in the initial MANCOVA also indicated only a significant effect for parent-reported externalizing behavioral problems, $F(2,32) = 7.24$, $p < .01$, partial $\eta^2 = .31$, and bootstrapped simple contrasts revealed that the T2-T1 differences were significantly larger for girls in gender-specific care vs regular care ($b = -4.18$, $SE_b = 1.24$, BCa 95% CI [-6.42, -1.61]), but not for girls vs boys in regular care ($b = -2.22$, $SE_b = 1.33$, BCa 95% CI [-4.76, 0.35]).
2. Bootstrapped simple contrasts, using the identical subset of subjects included in the initial MANCOVA, indicated that the T3-T1 decreases were relatively larger for girls in gender-specific care vs regular care, $b = -4.75$, $SE_b = 1.85$, BCa 95% CI [-8.06, -1.35]). No significant difference was observed for girls vs boys in regular care ($b = -1.62$, $SE_b = 1.76$, BCa 95% CI [-4.77, 1.135]).
3. For example, participants may conceivably have dropped out early due to a lack of improvement in externalizing behavior (or larger improvement) and participants may conceivably been started later due to higher levels of externalizing behavior (or lower levels). If so, then T1-T2 slopes would differ for participants with both T1 and T2 data vs. those with only T1 or T2.

Chapter 5

REDUCING BEHAVIORAL PROBLEMS AND REDUCING TREATMENT DURATION OF ADOLESCENTS IN SECURE RESIDENTIAL CARE: A MULTIPLE SINGLE-CASE EXPERIMENTAL DESIGN STUDY

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Abstract

Objective: Although some adolescents benefit from treatment in secure residential care, this type of care is criticized for several reasons. Therefore, in many countries, the general policy is to limit the length of stay of adolescents in secure residential care. However, research on length of stay and treatment effects of secure residential care on adolescents' behavioral problems during their stay is sparse. To address this knowledge gap, we examined adolescent development trajectories during secure residential care.

Methods: Using Single Case Experimental Designs (SCED) with time-series, forty adolescents referred to secure residential care completed a questionnaire on behavioral and attention problems every two weeks during a baseline (A) (of six weeks) and treatment period (B) (of eight to forty-four weeks). Two-level regression analyses were used to investigate the effects of secure residential care on total, externalizing, and internalizing problem behavior and on attention problems. In addition, we tested whether length of stay moderated effectiveness.

Results: On the individual level, the treatment showed a positive statistically significant effect on the total behavioral problems of 8% of the adolescents, on the externalizing behavioral problems of 0% of the adolescents, on the internalizing behavioral problems of 3% of adolescents and on the attention problems of 5% of adolescents. A statistically significant negative effect of the treatment on behavioral problems was found in 3% to 10% of the adolescents. The course of their development could be divided into four types: a decrease of problems over time, an increase of problems over time, no change of problems over time and individuals whose problems first decreased only to increase again after some time. On the group level, adolescents showed no significant decrease in problem behavior or attention problems from baseline to discharge. Length of stay did not moderate the results.

Conclusion: Based on the results we conclude that, although some adolescents seem to benefit from treatment in secure residential care, most adolescents fail to improve. In addition,

the length of stay was not associated with effectiveness, nor could it be explained by adolescents' individual characteristics. Future research should elaborate on justifying the (length of) stay of adolescents in secure residential care.

Introduction

Several meta-analyses have reported that adolescents, who are referred to a secure residential youth care (SRC) facility because of their severe problem behavior, can benefit from treatment (De Swart et al., 2012; Knorth et al., 2007; Strijbosch et al., 2015). The most positive results regarding behavioral problems were found within SRC that was evidence based (De Swart et al., 2012; Strijbosch et al., 2015), and in residential programs applying behavior-therapeutic approaches and stimulating family involvement (Knorth et al., 2007). However, SRC is the most expensive type of youth care that takes the youth out of their family environment (James, 2017; Knorth et al., 2007). Furthermore, SRC substantially restricts autonomy of the youth, one of the basic human needs (Ryan & Deci, 2017). Since the Convention on the Rights of the Child (1989) states that every child should grow up in a family environment for the sake of the full development of his or her personality, an exception is necessary to make out-of-home care such as a SRC placement possible:

States Parties shall ensure that a child shall not be separated from his or her parents against their will, except when competent authorities subject to judicial review determine, in accordance with applicable law and procedures, that such separation is necessary for the best interests of the child. (United Nations, 1990, Article 9)

For this reason, it is general policy in many countries, including The Netherlands, to limit the length of stay of adolescents in residential care, including SRC as much as possible (Dutch Government, n.d.; Dozier et al., 2014; Zemach-Marom et al., 2012).

Studies on the relation between length of stay and treatment outcomes of (secure) residential care are rarely performed and their findings are mixed. Gevers et al. (2020) for example found no correlation between length of stay of adolescents in both open and secure residential youth care in The Netherlands and change in internalizing and externalizing behavior. In line with these findings, a study in the United States of America (USA) of Boyer et al. (2009) also found no relation between length of stay in residential care and clinical outcomes. However, according to a Dutch study of Nijhof et al. (2012) adolescents staying in secure residential care for a relatively short period of time ($M = 10,1$ months) showed significantly more positive outcomes: they were more likely to live on their own afterwards than adolescents who stayed in care longer. The adolescents staying in care for a longer period were more likely to live in another residential care setting or in a family setting after discharge (Nijhof et al., 2012).

On the contrary, we know that adolescents who make repeated use of SRC in the Netherlands, have undergone a significantly shorter first treatment period in SRC than adolescents who do not make repeated use of secure residential care (Koster et al., 2016). Another study showing more positive outcomes for adolescents with a longer stay was performed in Israel in educational residential care settings. The findings of this study showed adolescents with a longer stay to exhibit significantly fewer emotional and behavioral adjustment problems at discharge than the adolescents with a shorter stay in care (Hofnung Assouline & Attar-Schwartz, 2020). Moreover, from family-style residential care we know that longer lengths of stay are related to obtaining a high school education (Ringle et al., 2010) and that adolescents staying in care for over six months having better educational, employment, and criminality outcomes at 24-month follow-up, than adolescents staying in care for less than six months (Huefner et al., 2018). The authors also show how these outcomes are associated with significantly more positive long-term estimated financial societal benefit (Huefner et al., 2018).

In an attempt to shorten the adolescents' length of stay in SRC Blankestein et al. (2021) developed the intervention 'ThuisBest' ('HomeBest'); an intervention that combines SRC with multisystemic therapy (MST). The goal of this combination was to allow adolescents to return home after SRC more quickly. Their findings showed that treatment in SRC on average takes six months. However, when the SRC placement is combined with a strong evidence based systemic intervention (i.e., multidimensional family therapy (MDFT), MST, relational family therapy (RFT)), this duration is reduced by six weeks, to an average treatment duration in SRC of 4.5 months. In contrast, when SRC is combined with a systemic intervention with a less strong evidence base (i.e., attachment based family therapy (ABFT), flexible assertive community therapy (FACT), forensic ambulant systemic therapy (FAST), systemic therapy (ST)), the duration of SRC is on average 8.3 months. Given that some trajectories combining evidence-based systemic interventions and residential care are explicitly aimed at reducing the length of stay in residential care this finding is not entirely surprising (Rovers et al., 2019). Furthermore, a higher level of family-centered attitude of the sociotherapists also predicted a shorter length of stay of adolescents in residential care (Blankestein et al., 2021).

Although previous studies have linked length of stay to adolescent treatment effectiveness, little is known about treatment effect trajectories of adolescents during their stay in SRC. Previous studies are mostly limited to a longitudinal design with only measurements at admission and at discharge, and in some cases follow-up (e.g., Eltink et al., 2017; Gevers et al., 2020; Strijbosch et al., 2015). Designs with more than two (repeated) measurements are rarely applied. Furthermore, findings are usually presented at group level and the development of the individual is disregarded, which detracts from the fact that every adolescent may have a unique developmental trajectory. Consequently, it is not yet sufficiently known which length of stay is most appropriate and whether shortening or extending the stay of an individual adolescent may be beneficial. Moreover, it is also unknown why the treatment of some adolescents in SRC

takes (much) longer than the treatment of others, knowledge that can be beneficial to shorten the stay of adolescents in SRC.

The present study

In this study, we examine the developmental trajectories of adolescents from two secure residential youth care locations in The Netherlands. By using Single Case Experimental Designs (SCEDs) with biweekly measurements, the aim of this study is to gain knowledge on the individual behavioral development trajectories of adolescents during SRC. Furthermore, the study aims to determine whether the differing length of stay of adolescents can be explained by the seriousness of their problems at admission, the development of their problems during their stay, the family therapy they received, their gender and their destination after discharge. This knowledge can be used as a clinical tool in deciding whether to continue treatment after a certain period or to seek appropriate after-care services. We will discuss the results in the light of the desire to minimize duration of residential youth care.

In this study, we address the following research questions:

- (1) In what way do the total, internalizing and externalizing behavioral and attention problems of adolescent boys and girls in secure residential care develop over time, during treatment, and is this development moderated by the length of stay?
- (2) Are there any differences between adolescents with a short stay (< six months) and adolescents with a long stay (> six months) in secure residential care regarding their behavioral (i.e., total, internalizing and externalizing), attention or family problems and age at admission, gender, destination after discharge, received family-oriented therapy and behavioral problems three months after discharge? The cutoff score of six months is chosen in line with other studies (e.g., Huefner et al., 2018).

Hypotheses

Regarding the first research question, we expect adolescents to show a gradual decrease of their behavioral and attention problems over time. Furthermore, since we assume that all adolescents who enter SRC suffer from severe behavioral problems and we expect all adolescents to experience a near-comparable level of problems at the time of discharge, we expect adolescents who stay in SRC for a relatively short period of time to show a quicker decrease of their problem behavior.

Regarding the second research question, since we expect all adolescents to experience a near-comparable level of problems at the time of discharge, we expect the behavioral, attention and family problems of adolescents with a relatively short stay to be less severe at admission, than the problems of adolescents with a relatively long stay in SRC. Furthermore, we expect that evidence-based family-oriented therapy associates with a shortened stay of adolescents in SRC. Lastly, we expect that adolescents with a longer stay transfer back home more often than adolescents with a short stay, since the transfer back home is expected to require more extensive preparation (Nijhof et al., 2012).

Methods

Participants

The study population consists of adolescents (aged 12-18 years) admitted to two secure residential youth care locations in The Netherlands (named Hestia; a girls-only facility and Midgaard; a mixed facility). In total, 91 adolescents admitted in 2018 and 2019 to one of the locations were asked by the first author to participate in this study. In both settings, the first six weeks of the treatment in SRC are seen as a stabilization and observation phase (=baseline phase). After being in SRC for six weeks, the actual treatment of the adolescents' problems starts. Adolescents who left SRC within these six weeks ($N = 18$) were excluded from the study,

since they did receive no or hardly any actual treatment. For these adolescents, SRC was, after the stabilization and observation phase, not considered the most appropriate option, for example because of psychiatric problems or a (mild) intellectual disability. In addition, the data of ten adolescents did not meet the criteria for usage in the analysis, since their ‘intervention’ period was too short to collect data on at least three timepoints. Furthermore, 23 adolescents did not agree to participate in the study, resulting in the participation of forty (63%) adolescents (M age = 15.55 years, SD = 1.38 years, 56.0% girls). Problems within the family (i.e., insufficient parenting skills) were found in 32% of the participating adolescents.

To determine whether the response group was representative for the eligible cases, we compared participants and non-participants on variables available for both groups. Participants and non-participants did not differ with regard to gender (44% vs 39% male), age (M = 15.55, SD = 1.38 vs M = 15.35, SD = 1.42), total behavioral problems (M = 6.75, SD = 5.08 vs M = 6.60, SD = 5.64), internalizing behavioral problems (M = 1.35, SD = 2.70 vs M = 1.30, SD = 1.70) and externalizing behavioral problems (M = 2.40, SD = 2.76 vs M = 1.50, SD = 1.18) or attention problems (M = 3.00, SD = 1.78 vs M = 3.80, SD = 4.21). However, participants stayed in residential care for a statistically significant shorter period of time (M = 208 days, SD = 121.71) than non-participants (M = 221 days, SD = 171.52); $t(69) = -5.14$, $p < .05$.

Procedure

Youth admitted to Midgaard between January 2018 and June 2018 and to Hestia between November 2018 and July 2019 were included in the study. We used two subsequent inclusion periods to be able to conduct the measurements. A researcher provided the adolescents with a questionnaire (on paper, in an attempt to maximize responses) every two weeks, and they were filled out by the adolescents during their entire stay in the residential care facility (N = 40) and three months after discharge (N = 30). Adolescents filled out the questionnaires ranging from seven to thirty-four times, with a mean of fifteen times. A written informed consent was

Reducing behavioral problems and treatment duration of adolescents in secure residential care: A multiple single-case experimental design study

obtained from the adolescents and their parents (or legal guardians) and the adolescents received a small compensation for their time in return. In addition, parents were presented questionnaires on behavioral problems and attention problems of their children and on problems within the family. These questionnaires ($N=48$) were provided at admission only, at the facility or during a home-visit. When processing the data, the participants names were replaced by a code to pseudonymize the data, according to ethical guidelines, as tested for by the medical ethical review committee (TWOR – 2018-24).

Measures

Brief problem monitor-youth (BPM-Y) and Brief problem monitor-parent (BPM-P)

The adolescents completed the Brief Problem Monitor-Youth (BPM-Y; Verhulst et al., 1997) every two weeks during their treatment. The BPM-Y questionnaire is the shortened version of the Youth Self-Report (YSR; Verhulst et al., 1997). Parents filled-out the BPM-P at admission only. The BPM-P is the shortened version of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), which are part of the Achenbach System of Empirically Based Assessment (ASEBA) (Achenbach & Rescorla, 2001). Both questionnaires are used to identify psychosocial problems and consists of 19 items, divided over three subscales, and one total scale. Answers are given on a three-point scale (0 = not true, 1 = sometimes true and 2 = very true). The subscales ‘internalizing behavioral problems’ (6 items, clinical cutoff score: ≥ 7) (e.g., ‘I feel worthless), ‘externalizing behavioral problems’ (7 items, clinical cutoff score: ≥ 7) (e.g., ‘I am disobedient at home’), and ‘attention problems’ (6 items, clinical cutoff score: ≥ 6) (e.g., ‘I don’t finish things I start on’) were used, as well as the ‘total behavioral problems’ (19 items, clinical cutoff score: ≥ 17) scale. The Cronbach alphas for the BPM-Y of both the internalizing problems scale and the externalizing problems scale was $\alpha = .94$. The internal consistency of the attention problems scale was $\alpha = .74$ and of the total scale $\alpha = .86$. The Cronbach alphas for the BPM-P of the internalizing problems scale was $\alpha = .72$ and for the externalizing problems

$\alpha = .81$. The internal consistency of the attention problems scale was $\alpha = .83$ and of the total scale also $\alpha = .83$.

Data analysis

Missing scores occurred in all participants. Missing value analysis (Little's MCAR test) revealed data were missing completely at random (MCAR) ($\chi^2(995) = 986,68; p = .568$) (Little, 1988). To increase statistical power, missing data were imputed five times by using multiple imputation (Peng & Chen, 2018). Since data were missing in an arbitrary pattern, the Markov Chain Monte Carlo method was used (Schafer, 2002).

Our first aim was to study in what way adolescents behavioral and attention problems developed during treatment. To do so, we performed (I) one-level (individual level) and (II) two-level (group level) regression analyses in MultiSCED (Declercq et al., 2020). As part of our first aim, the developmental trajectories of the adolescents were plotted in MultiSCED to be able to visually interpret in what way the behavioral and attention problems of the adolescents change over time (see Figure 1 to Figure 4, for some examples). The individual (one-level) developmental trajectories of the adolescents were plotted, according to the following equation:

$$\text{Score}_i = \beta_0 + \beta_1 \text{Time}_i + \beta_2 \text{Phase}_i + \beta_3 (\text{Phase} \times \text{Time})_i + e_i$$

With β_0 being the intercept, which is the group mean score during the baseline period, β_1 representing the increase or decrease during the baseline period, β_2 representing the change of intercept after treatment starts and β_3 representing the change of slope after treatment starts and the sampling errors (e_i).

Two-level regression analyses were performed according to the following equation:

$$\text{Score}_{ij} = \beta_0 + \beta_1 \text{Time}_{ij} + \beta_2 \text{Phase}_{ij} + \beta_3 (\text{Phase} \times \text{Time})_{ij} + e_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\begin{aligned}\beta_{2j} &= \gamma_{20} + \upsilon_{2j} \\ \beta_{3j} &= \gamma_{30} + \upsilon_{3j}\end{aligned}$$

In this equation, an index j is added to denote case j within the study. Each of the regression coefficients in the equation is divided into a fixed effect γ plus a random case-specific deviation υ , or random effect.

Lastly, to determine whether the level of behavioral and attention problems, and the effect of the treatment on the development of behavioral and attention problems, was moderated by the length of stay of the adolescent, the length of stay was added to the two-level regression analysis as a moderator, according to the following equation:

$$\text{Score}_{ij} = \beta_0 + \beta_1 \text{Time}_{ij} + \beta_2 \text{Phase}_{ij} + \beta_3 (\text{Phase} \times \text{Time})_{ij} + \beta_4 \text{Lengthofstay}_{ij} + \beta_5 (\text{Lengthofstay} \times \text{Phase} \times \text{Time})_{ij} + e_{ij}$$

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \upsilon_{0j} \\ \beta_{1j} &= \gamma_{10} + \upsilon_{1j} \\ \beta_{2j} &= \gamma_{20} + \upsilon_{2j} \\ \beta_{3j} &= \gamma_{30} + \upsilon_{3j}\end{aligned}$$

In the equation above 'length of stay' is added as a moderator with β_4 representing the moderating role of the length of stay on the level of behavioral problems during the baseline period and β_5 the moderating role of the length of stay on the change in slope after the treatment started.

Our second aim was to test for differences and similarities between adolescents who stay in SRC for a short period of time (< six months) and adolescents who stay in SRC for a long period of time (> six months). To do so, we used independent-samples t -tests for interval data. A Mann-Whitney U test was used when assumptions of the independent-samples t -test were violated (i.e., no normal distribution was found for self-reported internalizing ($W = .83, p$

= .03), externalizing behavioral problems ($W = .89, p < .01$) and attention problems ($W = .95, p = .03$), and for parent-reported internalizing behavioral problems ($W = .92, p < .01$). To analyze the categorical data (i.e., destination after discharge, family therapy and gender), Chi-square tests were used.

As part of our second aim, differences in the behavioral and attention problems of adolescents at time of follow-up, between adolescents with a short stay and adolescents with a long stay, were explored. Since one of the assumptions (i.e., normal distribution) of an independent-samples t -tests was violated, Mann-Whitney U tests were used. However, for the total behavioral problems the assumptions (i.e., independency of observations, no significant outliers, normality, and homogeneity of variances) for the use of an independent-samples t -test were met.

Results

Preliminary analyses

Adolescents' self-reported behavioral and attention problems at admission are shown in Table 1. Overall, adolescents report a relatively low level of total, internalizing, externalizing behavioral problems and attention problems at admission, with average scores, remarkably, below the clinical cut-off score.

Table 1.
Behavioral and attention problems at admission ($N = 40$)

Adolescents' problems	Clinical cutoff score	$M (SD)$	Clinical problems $N (%)$
Total behavioral problems	≥ 17	9.22 (5.82)	4 (10%)
Internalizing behavioral problems	≥ 7	2.80 (3.08)	5 (13%)
Externalizing behavioral problems	≥ 7	2.84 (2.51)	5 (13%)
Attention problems	≥ 6	3.69 (2.47)	11 (28%)

Development during placement

Individual development

A visual interpretation of the plotted developmental trajectories showed four types of developmental trajectories. The first type noticed showed the problems of the adolescents to be roughly stable over time (Figure 1), the second type showed the problems of the adolescents to (gradually) decrease over time (Figure 2), the third type showed problems to (gradually) increase over time (= negative development) (Figure 3), and the last type of development noticed showed the problems of the adolescents to decrease during the first weeks or even months of the treatment, however, after some time problems started to increase again (Figure 4). The plots of this last type of development consists of a ‘U-shape’.

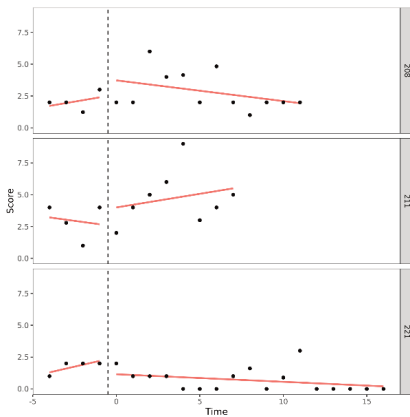


Figure 1. One-level regression analyses of total behavioral problems (y-axis) over time (two-weekly) (x-axis) after centering the time variable – no change over time

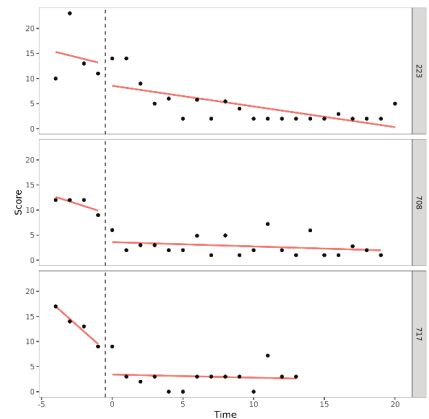


Figure 2. One-level regression analyses of externalizing problem behavior (y-axis) over time (two-weekly) (x-axis) after centering the time variable – decrease over time

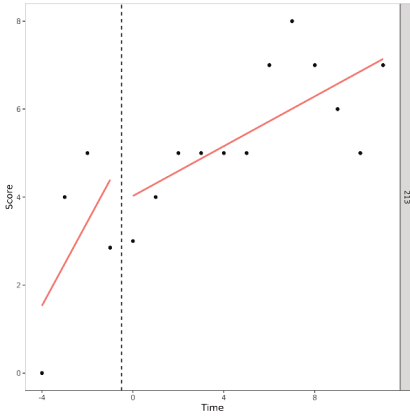


Figure 3. One-level regression analysis of externalizing problem behavior (y-axis) over time (two-weekly) (x-axis) after centering the time variable – increase over time

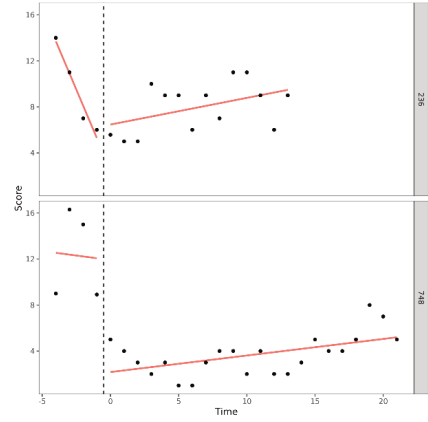


Figure 4. One-level regression analyses of total problem behavior (y-axis) over time (two-weekly) (x-axis) after centering the time variable – decrease and increase over time (U-shape)

The overall results of the analyses on the individual level are shown in Table 2. As can be seen from Figure 5 β_1 represents the baseline slope (during the stabilization phase). Furthermore, β_2 represents the immediate effect on the behavioral problems score of the start of the treatment. Lastly, β_3 represents the effect of the treatment on the slope.

Table 2
Adolescents' problem development (N = 40) in care

Adolescents' problems			Baseline slope (β_1)	Immediate effect of the treatment (β_2)	Effect of treatment on the slope (β_3)
Total behavioral problems	Sign. decrease		5 (13%)	3 (8%)	3 (8%)
	Sign. increase		2 (5%)	3 (8%)	4 (10%)
	Non-sign. development		33 (82%)	36 (84%)	33 (82%)
Internalizing behavioral problems	Sign. decrease		4 (10%)	1 (3%)	1 (3%)
	Sign. increase		0 (0%)	2 (5%)	3 (8%)
	Non-sign. development		36 (90%)	37 (92%)	36 (89%)
Externalizing behavioral problems	Sign. decrease		3 (8%)	2 (5%)	0 (0%)
	Sign. increase		0 (0%)	2 (5%)	3 (8%)
	Non-sign. development		37 (92%)	36 (90%)	37 (92%)
Attention problems	Sign. decrease		2 (5%)	0 (0%)	2 (5%)
	Sign. increase		3 (8%)	1 (3%)	1 (3%)
	Non-sign. development		45 (87%)	39 (97%)	37 (92%)

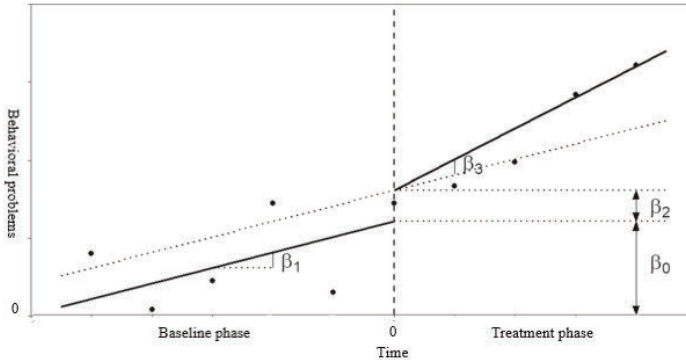


Figure 5. Graphical interpretation of the model parameters after centering the time variable. The intercept is expressed by β_0 , the baseline slope by β_1 , the immediate effect of the treatment by β_2 and the effect of the treatment on the time trend is expressed by β_3 .

Note. Reprinted from MultiSCED: A tool for (meta-)analyzing single-case experimental data with multilevel modeling, by Declercq et al., 2019, *Behavior Research Methods*, 52, p. 181.

From the findings in Table 2 it can be deduced that only a minor set of adolescents showed a statistically significant slope during baseline. Around 10% of the adolescents showed a statistically significant decrease in their problem behavior during the stabilization phase (β_1). In addition, a minor set of adolescents experienced an immediate effect of the start of the treatment (β_2). The direction of the effect differed between adolescents and showed to be both negative and positive. Dependent of the type of problem behavior, 0% to 8% of the adolescents experienced a positive effect of the treatment on the slope, and 3% to 10% experienced a negative effect of the treatment on their problem behavior (β_3).

Development on the group level

The analysis of the total behavioral problems, in MultiSCED, of the forty adolescents showed that, across cases, the total behavioral problems on average decrease statistically significant by 0.75 [$t(39.00) = -2.46, p = .02$] per time unit (of two weeks) (β_1) during the stabilization phase (baseline). During the stabilization phase, the outcome statistically significant decreases to 8.70 points (β_0) [$t(45.87) = 4.43, p < .01$]. The start of the treatment showed a statistically non-significant average immediate mean effect (β_2) of 1.28 [$t(44.47) =$

0.72, $p = .47$]. The statistically marginal significant effect of the treatment on the slope (β_3) was -0.10 [$t(38.94) = 1.90, p = .06$], indicating that the treatment decreases the time trend by -.10 points ($-0.75 - 0.10 = -0.85$).

Regarding internalizing problem behavior, the two-level analysis demonstrated that, across cases, the internalizing problem behavior statistically significant decreases on average by 0.41 [$t(39.00) = -3.02, p < .01$] per time unit (of two weeks) (β_1) during the stabilization phase (baseline). During the stabilization phase, the outcome statistically significant decrease to 1.88 (β_0) [$t(41.42) = 2.41, p = .02$]. The start of the treatment (β_2) did not show a statistically significant effect: 0.27 [$t(47.14) = 0.33, p = .74$]. The statistically significant treatment effect (β_3) on the slope was 0.34 [$t(39.40) = 2.49, p = .02$], indicating that the treatment increases the time trend by 0.34 points ($-0.41 + 0.34 = -0.07$).

For externalizing problem behavior, across cases, the problems statistically significant decreases on average by 0.32 [$t(39.00) = -3.04, p < .01$] per time unit (of two weeks) (β_1) during the stabilization phase (baseline). During the stabilization phase, the outcome statistically significant decrease until 1.97 (β_0) [$t(40.88) = 2.47, p = .02$]. The start of the treatment showed a statistically non-significant average immediate mean effect (β_2) of 1.19 [$t(42.12) = 1.65, p = .11$]. The statistically significant treatment effect on the slope (β_3) was 0.30 [$t(39.03) = 2.84, p = < .01$], indicating that the treatment increases the time trend by 0.30 points ($-0.32 + 0.30 = -0.02$).

Lastly, the development of the attention problems was analyzed. The two-level analysis in MultiSCED displayed that, across cases, the attention problems did not change statistically significant (β_1) during the stabilization phase (baseline); 0.13 [$t(39.00) = -1.00, p = .32$]. At the end of the stabilization phase, the attention problems reached a score of 4.72 (β_0) [$t(46.31) = 5.04, p < .01$]. The start of the treatment has no statistically significant immediate mean effect;

Reducing behavioral problems and treatment duration of adolescents in secure residential care: A multiple single-case experimental design study of 0.51 [$t(45.70) = 0.75, p = .45$]. The analysis showed no statistically significant effect of the treatment on the slope: $-0.06 [t(38.10) = -1.19, p = .24]$.

The moderating role of the length of stay on the treatment effect on the slope

Regarding total behavioral problems, the length of stay coefficient estimate indicates that for each week an adolescent stays longer in SRC, the average behavioral problems score is 0.10 points lower [$t(36.97) = -0.97, p = .34$], however, this effect of length of stay is not statistically significant. Furthermore, the estimates for the effect of length of stay on the treatment effect on the slope (length of stay \times phase \times time) is 0.002 for each extra week of stay in SRC [$t(28.43) = 0.17, p = .87$], but this finding again is not statistically significant.

In addition, the moderating role of length of stay on the level of internalizing behavioral problems was not statistically significant either, $-0.01 [t(37.46) = -0.28, p = .78]$, neither was the moderating role of length of stay on the treatment effect on the slope, $-0.001 [t(21.25) = -0.14, p = .89]$.

Regarding externalizing problem behavior, for every week the adolescents stayed in care longer, the problem score was 0.03 lower. However, this finding was statistically not significant [$t(37.19) = -0.76, p = .45$]. The moderating role of length of stay on the treatment effect on the externalizing problem behavior, again was not statistically significant, [$t(14.51) = -0.17, p = .87$].

Lastly, the length of stay did not statistically significant moderate the level of attention problems, $-0.07 [t(36.23) = -1.56, p = .13]$, neither did length of stay moderate the treatment effect on the slope, $0.005 [t(24.56) = 0.87, p = .39]$.

Comparison of adolescents with a short and long stay in SRC

In Table 3 and Table 4 we present the results of the comparisons between adolescents leaving SRC within six months and adolescents staying in SRC more than six months. The

results of this analyses were consistent with our analyses on the moderating role of the length of stay of adolescents in SRC.

Power analyses revealed that the sample size was large enough for the t-tests and Mann-Whitney U tests to detect a large effect. Adolescents remaining in care for a longer period are slightly older at the time of admission; $t(48) = -0.31, p < .05$, and more often female, $\chi^2(1) = 5.99, p < .05$.

Table 3

Comparisons between adolescents < 6 months in care and adolescents > 6 months in care

	Adolescents < 6 months in care			Adolescents > 6 months in care			t	U
	N	M	SD	N	M	SD		
<i>Behavioral problems</i>								
Total behavioral problems ¹⁺	29	9.31	6.91	21	9.86	4.10	-0.32 ^{ns}	
Externalizing behavioral problems ¹⁺⁺	29	2.86	2.68	21	2.90	3.08		-.63 ^{ns}
Internalizing behavioral problems ¹⁺⁺	29	2.76	3.18	21	3.05	2.38		-.15 ^{ns}
Attention problems ¹⁺⁺	29	3.69	2.66	21	3.90	2.07		-.66 ^{ns}
Total behavioral problems ²⁺	28	74.54	28.59	18	68.61	23.45	.73 ^{ns}	
Externalizing behavioral problems ²⁺	28	30.71	12.96	19	28.95	12.04	.46 ^{ns}	
Internalizing behavioral problems ²⁺⁺	28	16.54	7.32	19	17.47	9.70		-.03 ^{ns}
Attention problems ²⁺	28	7.29	4.16	19	7.42	5.34	.36 ^{ns}	
<i>Family context</i>								
Low quality parent-child relationship ²⁺	29	11.93	5.33	19	12.16	5.18	-0.15 ^{ns}	
Parenting problems ²⁺	29	17.86	4.77	19	16.95	4.70	0.65 ^{ns}	
Age⁺	29	15.22	1.18	21	16.01	1.53	-2.07*	

Note. Significant differences are presented in bold.

* $p < .05$

¹Adolescent-report

²Parent-report

⁺ Independent-samples *t* test

⁺⁺ Mann-Whitney *U* test

Table 4

Comparisons between adolescents < 6 months in care and adolescents > 6 months in care

	Adolescents < 6 months in care		Adolescents > 6 months in care		Test
	N	%	N	%	
<i>Destination after discharge</i>					
Back home	11	38	10	48	$\chi^2(2, N = 50) = .60^{\text{ns}}$
Follow-up intervention	17	59	10	48	
Living on their own	1	3	1	4	
<i>Family therapy</i>					
Yes	18	62	14	67	$\chi^2(1, N = 50) = .11^{\text{ns}}$
No	11	38	7	33	
<i>Gender</i>					
Boy	17	59	5	24	$\chi^2(1, N = 50) = .01^*$
Girl	12	41	16	72	

Note. Significant differences are presented in bold.

* $p < .05$

Behavioral and attention problems at follow-up

As can be seen in Table 5, the comparison of the problems of adolescents with a relatively short stay (< 6 months) and adolescents with a relatively long stay (> 6 months) did not differ statistically significantly for total, externalizing and internalizing behavioral problems at follow-up. Nor did the attention problems of adolescents staying for a short period of time differ from the attention problems of adolescents staying in care for a longer period.

Table 5
Follow-up scores of adolescents with a short and a long stay in SRC

	Short stay (< 6 months)			Long stay (> 6 months)			<i>t</i>	<i>U</i>
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>		
Total behavioral problems ^{1*}	20	6.75	5.08	10	6.60	5.64	.07 ^{ns}	
Internalizing behavioral problems ^{1**}	20	1.35	2.70	10	1.30	1.70		-.47 ^{ns}
Externalizing behavioral problems ^{1**}	20	2.40	2.76	10	1.50	1.18		-.67 ^{ns}
Attention problems ^{1**}	20	3.00	1.78	10	3.80	4.21		-.16 ^{ns}

¹Self-report

*Independent-samples *t* test

**Mann-Whitney *U* test

Discussion

The first aim of this study was to determine in what way the emotional, behavioral and attentional problems of adolescents develop during their stay in SRC. We expected adolescents to show a gradual decrease in their problems while offered intensive treatment. Contrary to our expectations, on average on the group level, adolescents' emotional, behavioral and attention problems fail to decrease during their placement in SRC. However, the analyses on the individual level showed the development of adolescents' problems varied widely between individuals. On the individual level, total, internalizing and externalizing behavioral problems and attention problems decrease in respectively 13%, 10%, 8% and 5% of the adolescents during the stabilization phase. The start of the treatment shows an immediate positive effect on the behavioral problems in 0% to 8% of the adolescents, and in 0% to 8% of cases a positive effect of the treatment was found on the slope. These findings show that, depending on the type of problems, at least 92% of adolescents fail to improve during treatment, compared to the

stabilization phase. This means that despite the drastic out-of-home placement, the intensive treatment and the relatively high costs, only few adolescents seem to profit from treatment in SRC. A possible explanation for adolescents failing to improve is that for them, treatment in SRC is not suitable, given that these adolescents show non-clinical problems at admission. After all, previous research has shown, especially adolescents with the most severe problem behavior benefit from treatment in SRC (First author et al., under review; Nijhof et al., 2011).

In our sample, remarkably, a significant number of adolescents report no (behavioral) problems at admission. For a third of the adolescents, at admission, there were problems in the familial context. This may indicate that placement in SRC is, for some adolescents, the outcome of problems within the family, poor parenting by their parents potentially combined with having no suitable, less restrictive, care available (Nijhof et al., 2011; Van Dam et al., 2010). The fact that some adolescents (around 10%) already showed a decrease in their behavioral problems during baseline (stabilization phase) may have reduced the effect of the treatment in the analyses. Moreover, lack of evidence of a treatment effect is not necessarily evidence for the absence of a treatment effect. Our findings using SCEDs showed much smaller success rates on the individual level, than the results using the reliable change index (RCI). In a previous study using the RCI success rates of 23% to 57% were found in improving (internalizing and externalizing) behavioral problems, according to self-reports, from admission to discharge (First author et al., 2022).

Another possibility for adolescents failing to show improvement is prompted by the possible iatrogenic effects of SRC critics warn about. In our study, deterioration of behavioral problems during the stabilization phase was seen in 0% to 8% of adolescents (see Table 2) and a negative effect of the treatment was found in 3% to 10% of adolescents. In addition, adolescents failing to report problems at admission can possibly be explained by adolescents' lacking problem awareness or pretending to behave better than they do by adapting behaviors

Reducing behavioral problems and treatment duration of adolescents in secure residential care: A multiple single-case experimental design study to the SRC treatment environment (Author's own, 2018). In addition, previous research in Dutch SRC showed parents to report behavioral problems of their children to be more severe than adolescents themselves do (First author et al., 2022).

Another finding contrasting with our expectations is that the development of adolescents' problems over time is not moderated by treatment duration. This indicates that adolescents with a relatively short stay do not improve quicker than adolescents with a longer length of stay in SRC. What we do see is that, for adolescents with a long stay (> 6 months), internalizing and externalizing behavioral problems continue to decrease even after adolescents being in care for over six months, finally resulting in lower levels of internalizing and externalizing problem behavior. These findings are in line with the outcomes educational residential care settings in Israel, showing adolescents with a longer stay to exhibit fewer emotional and behavioral problems (Hofnung Assouline & Attar-Schwartz, 2020). Although it is Dutch policy that the duration of the placement of an adolescent in SRC is as short as possible, and as long as necessary, there is no prescribed maximum duration. Therefore, a placement duration of over six months is not necessarily in conflict with Dutch policy (Dutch Government, n.d.). However, organizations providing SRC are experiencing increasing pressure from society to further shorten the duration of SRC placements. And one may wonder whether there are cases when such a prolonged stay in SRC is warranted. Could intensive ambulant or residential care lead to the same outcome, when the need for secure care no longer exists? Our results, showing adolescents to keep developing in a positive way, also after six months of stay in SRC and beyond, seem to indicate that a relatively long stay can be helpful for some adolescents. However, as we shall see below, other adolescents with comparable levels of problem behavior do leave SRC after a significantly shorter period (i.e., three to six months).

Our findings also show that the change of the total, internalizing, and externalizing behavior problems, and attention problems over time varied widely between adolescents. We

determined four types of development: a decrease of problems, an increase of problems, no change of problems over time and something we called a ‘U-shape’ development (i.e., at first a decrease of problems, followed by an increase of problems). Especially the ‘U-shape’ type of development calls for further examination, because, according to the level of their problem behavior, these adolescents might have been better off leaving SRC after a shorter period of time, more specifically at the time their problems were the least severe. Adolescents who are not discharged from SRC while performing at their best can easily lose motivation for treatment. Losing treatment motivation can be an explanation for their problem behavior to worsen (Van der Helm et al., 2014). Strikingly, other adolescents with a comparable level of behavioral problems do discharge from SRC after a significantly shorter period. Possibly this difference is caused by factors other than the (behavioral) problems of the adolescents. In an attempt to explain these differences, adolescents with a relatively short stay were compared with adolescents with a relatively long stay. As we can see from our findings, the destination after discharge of the adolescents is offers no possible explanation, since it is not related to length of stay. However, waiting lists for follow-up care can pose a threat to shortening the length of stay in SRC. It is a serious possibility that for some of the adolescents follow-up care was not (yet) available at the ideal time of discharge from SRC. We know from practice that this sometimes leads to extending the treatment duration in SRC, which can have negative effects on the adolescents’ treatment motivation and behavioral problems. For example, a previous study in Dutch SRC has shown approximately 10% to 20% of adolescents experience a prolonged stay in SRC due to the absence/availability of suitable follow-up care (Hospers & Van der Zwaan, 2018).

To explain the differing lengths of stay between adolescents we compared adolescents’ problems at admission for adolescents with a relatively short stay to adolescents with a long stay. We expected adolescents with a short stay to show less serious problems (i.e., total,

internalizing and externalizing behavioral problems, attention problems, and family problems) at admission, compared to adolescents with a long stay. Remarkably, our findings did not meet our expectations. We only found that adolescents remaining in care for a longer period are more often female. However, our findings indicate that adolescent problems at admission do not determine the length of stay.

These findings are in contrast with findings by Dirkse et al. (2018) in Dutch SRC that the more risk factors present in the adolescent, the longer the SRC placement duration. Dirkse et al. explored 57 risk factors, divided over 11 domains: individual factors, substance abuse, daily activities, internalizing problem behavior, externalizing problem behavior, other problem behavior, presence of trauma, sexual abuse, sexual transgressive behavior, family, and the context. However, they did not investigate the individual contribution of the risk factors to adolescents' length of stay. These findings suggest that length of stay is possibly not solely determined by behavioral problems, as we have measured, but also by (many) other risk factors.

Based on previous research (Blanckstein et al., 2021), we also expected an association between the use of family therapy and a shorter SRC placement. However, this expectation was not confirmed by the results of our analyses. Furthermore, we expected adolescents with a long stay to transfer back home more often than adolescents with a short stay, since the transfer back home is expected to require more extensive preparation. It was assumed plausible that adolescents who progress to follow-up care are more suitable for this transfer after a shorter period of treatment in SRC, than adolescents who return home. In contrast to our expectations, we failed to find any differences in destination after discharge for adolescents staying in SRC for a short period of time, compared to adolescents staying in SRC for a long period of time. A possible explanation is that follow-up care is not always immediately available when adolescents are ready for the next step in their trajectory (Hammink et al., 2016; Hospers & Van der Zwaan, 2018; Van Dam et al., 2017).

We did however find that adolescents who stay in care for a longer period of time are, on average, older at admission. It is conceivable that older adolescents are progressing to living on their own after discharge more often than younger adolescents do, and that it takes more time to prepare an adolescent to live on its own than to return home or to progress to a less intensive type of care. However, analysis already showed that there are no differences in destination after discharge between adolescents with a short and long stay in SRC. In addition, this finding contrasts with the findings of Dirkse et al. (2018), who found younger adolescents to stay in care for a longer period of time. A possible explanation for our findings is that younger adolescents are more receptive to the help than older adolescents, which results in the former developing positively quicker.

Our last aim, as part of the second research question, was to compare follow-up scores (i.e., 3 months after discharge) for adolescents with a short stay compared to the scores of adolescents with a long stay. We expected that adolescents leaving SRC within six months would show more serious behavioral problems at follow-up than adolescents staying in care for over six months. Our findings showed that internalizing and externalizing behavioral problems, and for attention problem severity three months after discharge were the same for adolescents with a short stay and long stay. This seems to indicate that adolescents have left SRC at the right moment in time. Furthermore, it indicates that the problem scores of adolescents staying in SRC for less than six months are relatively stable over time after discharge or even improve and that adolescents staying in care for over six months slightly deteriorated after discharge. These findings are in contrast to the outcomes of family-style residential care in the USA, where adolescents staying in care for a longer period of time showed more positive outcomes regarding education, employment and delinquency at 24-month follow-up (Huefner et al., 2018). Although not part of this study, it would be interesting to see if the adolescents with a short stay in our sample indeed make repeated use of SRC more often than adolescents with a

Reducing behavioral problems and treatment duration of adolescents in secure residential care: A multiple single-case experimental design study
long stay, in line with findings by Koster et al. (2016). The level of their problems at follow-up does not make this plausible.

Limitations

This study has several limitations. To maximize response rates questionnaires were provided face-to-face and not digitally. Collecting repeated measurements this way is extremely labor-intensive and continuously motivating adolescents in secure residential care to participate is hard, therefore, the sample size is relatively small, causing a threat to statistical power. It is possible that with a larger sample size more differences would have been found between adolescents with a short stay compared to adolescents with a long stay. Furthermore, only self-reports were used, while previous research showed parents to report their childrens' problems to be more severe than adolescents reported their problems themselves. Unfortunately, research experiences in clinical practice taught us that conducting biweekly measurements among parents was not expected to yield an acceptable response rate (>25%).

The repeated measurements contain a significant amount of missing values, also posing a threat to statistical power. Furthermore, missing data improves the risk of bias and decreases the generalizability of the data. We, however, have attempted to reduce these risks by means of multiple imputation techniques.

Fourth, we used an AB design without a baseline before treatment, because an ABA design (A = baseline before treatment, B = treatment in SRC and A = follow-up measurements after treatment) is not possible in SRC. To accommodate referral to SRC a judge must authorize placement. When the judge authorizes placement, the adolescent is directly admitted to an SRC facility, making it impossible to collect baseline measurement before treatment. Furthermore, we attempted to collect measurements after treatment, but this resulted in an insufficient number of responses. Comparing the treatment phase to a baseline before treatment may have led to other findings.

A fifth limitation is that we had no information about the decision to end the placement in SRC for the individual adolescents. This information could have provided an explanation for the treatment duration of SRC for individual adolescents.

To explore similarities or differences at time of follow-up, we used non-parametric tests. However, non-parametric tests are known to be more conservative and having less statistical power than parametric tests. Non-parametric tests are also more likely to produce a Type II error than parametric tests. Therefore, it could have been possible that there were indeed differences at follow-up we overlooked by using non-parametric tests.

Implications for practice and future research

We encourage researchers to do more in-depth research, for example by using mixed methods single case research (MMSCR) (i.e., by integrating quantitative and qualitative research methods) (Onghena et al., 2019), into reasons for terminating treatment in SRC, to explore possible explanations for the differing treatment duration of SRC between adolescents. This information can be a further step in determining the ideal length of stay for adolescents in SRC and possibilities to shorten the length of stay of adolescents in SRC. Furthermore, in line with our findings, we recommend intensive screening of adolescents' problems and strengths at admission and during treatment by care professionals. Intensive screening can help practitioners to decide whether SRC is the most suitable type of care for an adolescent, and it helps to determine whether treatment is still effective after a certain period. Intensive screening at admission and over time is not yet common practice in SRC. Combined with face-to-face measurements, we recommend using a digital app to follow adolescents during treatment to capture real-time ecological treatment processes (cf. Altman, Shapiro, & Fisher, 2020; Jensen-Doss, Douglas, Phillips, Gencdur, Zalman, & Gomez, 2020). Although more and more youth care organizations have adopted the method of data-driven decision making, future research

Reducing behavioral problems and treatment duration of adolescents in secure residential care: A multiple single-case experimental design study can help gain knowledge about how to effectively implement this philosophy into every level of a youth care organization.

Conclusion

Our findings show that most adolescents referred to treatment in SRC fail to benefit from this type of care. Only a specific group of adolescents improves regarding their behavioral problems. It is plausible that adolescents are referred to SRC when no alternative treatment is available. Intensive screening can prevent adolescents to be referred to SRC unjustified. Furthermore, alternative interventions for adolescents that fail to benefit from SRC are urgently needed.

Some adolescents continue to develop positively after a stay of over six months, however, the level of their individual and family problems show no justification for continuing their treatment for such a long time. Repeated screening is advised, since discharging from SRC seems possible when the most serious developmental threats have decreased. Consequently, this could help shortening the length of stay of adolescents in SRC. Further research is necessary to gain knowledge about the differences of length of stay of adolescents in SRC.

Chapter 6

GENERAL DISCUSSION

Introduction

Although several meta-analyses (e.g., De Swart et al., 2012; Knorth et al., 2008; Strijbosch et al., 2015) reported that (secure) residential care is associated with the improvement of adolescent behavior, this type of care received a lot of criticism in recent years. The critics point to the possible iatrogenic effects of residential care, caused by occupational and psychosocial deprivation, repression (Van IJzendoorn et al., 2020), and deviancy training (Souverein et al., 2013; Weis et al., 2005). Furthermore, the limitation of autonomy of the adolescents in SRC (Ryan & Deci, 2017) and the organization of care outside the family life of the adolescent are seen as undesirable (James, 2017). Therefore, in many countries, including The Netherlands, it is general policy to limit the length of stay of adolescents in (secure) residential care as much as possible (Central Government, n.d.; Dozier et al., 2014; Zemach-Marom et al., 2012). Moreover, the Dutch government intends to completely abolish secure residential care by 2030 and replace it with small-scale facilities (Central Government, 2022).

Comparing secure residential care to possible alternative interventions

In line with this criticism, we explored the outcomes of SRC to promising alternative interventions for adolescents with severe problem behavior. Accordingly, we investigated the outcomes of (secure) residential care to the outcomes of two specific types of non-residential youth care: Treatment Foster Care Oregon for Adolescents (TFCO-A) and home-based treatment (HBT) (Chapter 2). The meta-analysis showed a small statistically significant overall effect ($d = -.21$), 95% CI [-0.338 - -0.009], indicating that non-residential youth care was slightly more effective than residential youth care in treating behavioral problems. For the meta-analysis a total of 145 effect sizes for different types of behavioral problems are derived from 24 controlled studies ($N = 16,943$ participants). Moderator analysis revealed that compared to (secure) residential care, TFCO-A yielded a larger effect size ($d = -.36$) than HBT ($d = -.08$),

on total, internalizing, and externalizing behavioral problems, delinquency, and substance abuse.

Analyses revealed that outcomes of (secure) residential care compared to non-residential care do not differ based on factors such as the measured outcomes and the measurement moment. These findings indicate that TFCO-A showed better results than (secure) residential care on all outcome measures and at both discharge and follow-up. Neither do outcomes of non-residential care compared to residential care differ based on the adolescents' gender, age, or ethnicity, indicating that TFCO-A showed better results than residential care, independent of adolescents' gender, age, or ethnicity. Moreover, (secure) residential care displayed no additional value for youth who are treated at home.

Improving treatment in secure residential youth care

However, since some adolescents face a serious threat to their safety or are at high risk of withdrawing themselves of the care they need, it seems that, despite the criticism about secure residential youth care, the intensity and protective context of SRC is inevitable for these youth (e.g., when foster care or less restrictive types of residential youth care have failed) (Ainsworth, 2017; Gutterswijk et al., 2020). The safety of the adolescents and the people around them cannot always be guaranteed when offering homebased treatment to them. Furthermore, TFCO-A is, unfortunately, not always available. Therefore, we believe residential care seems an option only if TFCO-A is not available and living at home is no longer possible because the child's (immediate) safety is at stake, or the child withdraws itself from the treatment that is seen as necessary for healthy development. However, there are many ways SRC can be offered. Optimization of the treatment effects and the pedagogical climate is required (for example by offering care in small-scale facilities and in closer collaboration with the family). In addition, while comparing the outcomes of residential and non-residential care, we noticed the population of both treatment forms somewhat differ from each other regarding behavioral problems. The

behavioral problems of children and adolescents in residential care are, on average, more severe in residential care than in non-residential care. Especially in the studies using propensity score matching, the children and adolescents with the most severe behavioral problems (in residential care) were left out of the analysis. We believe further research on this part of the population is necessary.

The risks and needs of adolescents in care

One way to deal with the criticism of SRC is to explore or to develop alternative interventions to serve adolescents with severe problem behavior. Another way to deal with the criticism is to improve the treatment offered in SRC, by tailoring the intervention to the risks and needs of the adolescents treated. Therefore, additional knowledge about the risks and needs of adolescents in SRC is necessary. In treatment in SRC, problem behavior is often the main target since most adolescents are referred to secure residential care programs because of their serious internalizing or externalizing problem behaviors. To improve the outcomes, treatment should match the risks and needs of the adolescents according to the risk-need-responsivity principles (Andrews & Bonta, 2007).

In **Chapter 3** we explored both individual (i.e., psychological PTSD symptoms, perceived competence, adaptive emotion regulation, and maladaptive emotion regulation) and family factors (i.e., parent-child relationship and parenting problems) as potential protective and risk factors for behavioral problems of adolescents in secure residential care programs. Given that secure residential care is provided to treat behavioral problems, these individual and family risk factors can be the target of individually tailored treatments in these settings (Moltrecht et al., 2020; Wiggings et al., 2009).

Gender-specific care for girls in SRC

To improve effectiveness of SRC, organizations are starting gender-specific care facilities, since girls seem to have different treatment needs than boys (Handwerk et al., 2006;

Nijhof, 2011; Sonderman et al., 2015; Weis et al., 2005). The study presented in **Chapter 3** on behavioral problems, and potential protective and risk factors for those problems, of 255 adolescents residing in Dutch SRC, revealed that based on parent reports, in almost 78% of adolescents residing in SRC, behavioral problems within the clinical range are present. A combination of both internalizing and externalizing problem behavior within the clinical range is found in almost 65% of these adolescents. Another common problem within the population, and a possible risk factor for problem behavior, are PTSD symptoms. At the time of admission to SRC PTSD symptoms are reported by almost half of the girls and one fifth of the boys. In addition, this study showed that PTSD symptoms, maladaptive emotion regulation, impaired perceived competence, which are possible risk factors for problem behavior, and internalizing behavioral problems at admission to SRC are more severe in girls than in boys. Boys, on the other hand, experienced more severe externalizing problem behavior, and their parents reported a more problematic parent-child relationship, and more parenting problems than the parents of girls did, possibly making them more prone to the development of behavioral problems. Moreover, the study proved that maladaptive emotion regulation, PTSD symptoms, competence perception and parenting problems are found to be related to the display of (more serious) behavioral problems. These factors are therefore to be prioritized in the treatment of behavioral problems of adolescents in SRC.

Effectiveness of secure residential youth care

Results at discharge and at follow-up

Since treatment in SRC is inevitable for some youth due to the serious threats to their safety and failure of foster care or less restrictive types of residential youth care to reduce their problems (Ainsworth, 2017; Gutteriswijk et al., 2020), it is important to know whether SRC can be effective in treating behavioral problems. Furthermore, it is important to know whether offering female-specific care, tailored to the specific risks and needs of girls, is justified and

leads to more positive outcomes for adolescents referred to SRC. According to critics, SRC is inappropriate for girls, since the treatment is said to be based on knowledge about boys, since they have been the main target group for years (Nijhof & Engels, 2015). Moreover, the seriousness and nature of problem behavior and risk factors at time of admission differ (partly) for boys and girls (Handwerk et al., 2006; Gutterswijk et al., 2022; Nijhof, 2011; Sonderman et al., 2015; Weis et al., 2005).

In **Chapter 4** we presented a study aimed at investigating the appropriateness of regular SRC for treating problems of both boys and girls. Furthermore, the study aimed to research the possible added value of gender-specific care for adolescent girls in SRC. Therefore, we studied the behavioral change and change within risk factors of adolescent boys and girls during their stay in SRC. The study revealed that, on the group level, behavioral problems diminished significantly for both boys and girls. In addition, the analyses disclosed greater effectiveness of gender-specific care girls compared to regular care for girls in diminishing externalizing problem behavior. However, the outcomes of gender-specific care for girls compared to regular care for girls were similar for internalizing behavioral problems, PTSD symptoms, emotion regulation, perceived competence, and family problems. These findings at least partly justify gender-specific care.

Additional analyses performed at the individual level indicated that, depending on the outcomes, 0% to 58% of the adolescents improved during their stay in secure residential care, 25% to 88% showed no change, and 0% to 39% deteriorated. These findings show that the treatment effect differs highly between individual adolescents, indicating SRC to be appropriate for some, but not for all adolescents. Furthermore, it is alarming that some adolescents even show an increase of their problems during their stay in SRC. These results make clear that organizations should prevent adolescents for whom SRC is inappropriate to be referred to SRC.

The development of interventions that can serve as an alternative to treatment in SRC is therefore highly necessary.

Behavioral development during treatment

Although several meta-analyses revealed that treatment in (secure) residential care is associated with a decrease in behavioral problems (e.g., De Swart et al., 2012; Strijbosch et al., 2015), and the previous study partly confirms these findings, it is general policy in many countries to limit the length of stay of adolescents in SRC as much as possible. As the study presented in **Chapter 4** displayed, treatment results differ highly between individuals. However, there is a general lack of knowledge of the behavioral development trajectory of adolescents during treatment in SRC. Knowledge about the trajectory of adolescent's individual behavioral development during treatment, can be helpful in deciding whether to continue treatment after a certain period or to seek appropriate after-care services. By using biweekly measurement in single case experimental designs (SCEDs), in the fourth and last study (**Chapter 5**) knowledge was gained on the course of behavioral development over time.

The findings of this study showed that, on the group level, total, internalizing, and externalizing problem behavior significantly diminish during treatment. Furthermore, adolescents' attention problems also significantly diminish over time. In addition, individual behavioral change, measured every two weeks, of adolescents who stayed in care for a relatively short period of time (i.e., < 6 months) compared to the behavioral change of adolescents who stayed in care for a relatively long period of time (i.e., > 6 months), revealed no differences. Moreover, the seriousness of the behavioral problems of adolescents who stayed in care for a relatively short period of time do not differ from the behavioral problems of adolescents who stayed in care for a relatively long period of time, at the time of admission, at the time of discharge or at follow-up (i.e., 3 months after discharge). The study shows the dilemma of extensively limiting the freedom and autonomy of adolescents to treat their behavioral

problems, whilst success is not guaranteed. The findings display that adolescents who stay in care for over six months keep developing in a positive way. However, at follow-up, problems scores of adolescents with a relatively short stay (i.e., less than six months) and adolescents with a relatively long stay (i.e., over six months) are similar. The adolescents who stay in care for over six months demonstrate the largest relapse. In the end, a relatively long stay seems not justifiable, based on behavioral problem scores.

Strengths and limitations

The studies in this dissertation show several strengths. First, in analyzing the data, we aimed to use several state-of-the-art methods. For example, the comparison of the effectiveness of non-residential youth care and residential youth care (Chapter 2) in diminishing behavioral problems of adolescents was performed by using three-level random-effects meta-analysis, making it possible to not only study differences in effect sizes between studies, but also within studies. Moreover, to study the behavioral development of adolescents during placement in SRC in more depth (chapter 4), we used a multiple single-case experimental design (SCED), which resulted in a more conservative approach of the outcomes.

Secondly, to explore the risks and needs of adolescents in SRC (Chapter 3) and the outcomes of SRC (Chapter 4) standardized questionnaires were used and completed by both adolescents themselves and their parents. Analyzing data from a multiple informant approach adds important nuance to interpreting behavioral findings, since informants commonly disagree regarding the seriousness of problem behavior (Laird & De Los Reyes, 2013). In the present study we see, on average, parents to report adolescents' problems to be more severe than adolescent report themselves. In addition, regarding externalizing behavioral outcomes, parents report more positive results than adolescents' do themselves. On the contrary, adolescents' report more positive change in internalizing behavioral problems than their parents do. This is possibly caused by adolescents underreporting their externalizing problem behavior and

internalizing behavioral problems are experienced more clearly by the adolescents themselves than by the people around them. Third, we collected our data within clinical practice (chapter 3, chapter 4, and chapter 5) and we approached the participants in several ways (e.g., directly and through the care group worker (mentor), through telephone, email, and home visits, digital and on paper) to maximize the response rate. Doing so largely improves the ecological validity of the findings (Andrade, 2018). And lastly, in exploring the outcomes of SRC using measurements at admission, discharge and follow-up (six months after discharge) and by using SCED, we performed the analyses on both the group and the individual level. The information offered unique insights into the developmental trajectories of adolescents' behavioral problems, whilst designs with more than two timepoints (admission and discharge) are rarely applied. Our approach resulted in findings with greater generalizability and much greater applicability in clinical practice. These implications for clinical practice can be found in the next paragraph.

However, some limitations should be kept in mind when interpreting the results of the studies. First, since a cross-sectional design was used in the study in chapter 2 it is not suitable for drawing conclusions about causality. Secondly, the sample sizes of our empirical studies were relatively small, causing a threat to statistical power. To increase the meaningfulness of the findings, we used conservative statistical methods, which may have, however, reduced the chances of finding statistically significant difference. Therefore, future research should replicate these studies with using larger samples of adolescents. Fourth, due to the relatively small sample size, we were unable to distinguish between adolescents with clinical pretest scores and those with nonclinical pretest scores in our studies on the effectiveness of SRC (chapter 4 and chapter 5). The inclusion of adolescents with a non-clinical score at admission may have resulted in an overly conservative estimate of the effectiveness of SRC.

Fifth, in our study on the potential added value of gender-specific care for girls (chapter 4), we compared the outcomes for girls who stayed in a girls-only care facility, that uses a

gender-specific care approach to the outcomes for girls who stayed in a regular SRC facility. It is, however, not possible to conclude whether this added value can be attributed to the fact that girls are treated without boys or to the substantially different, i.e., gender-specific, care approach. Furthermore, concepts such as treatment integrity, social climate and the expertise of the care group workers was not taken into account in these analyses, resulting in possible alternative explanations for the differences and similarities in the outcomes of regular SRC and gender-specific SRC for girls. And lastly, in our study of repeated measurements of behavioral problems (chapter 5), we only used questionnaires filled out by the adolescents themselves. From our previous study on effectiveness (chapter 4) we know parents report their adolescents' problems as more severe than adolescents do themselves. Using data from the adolescents themselves only may have caused a distorted image of problem seriousness and SRCs' effectiveness.

Implications for practice and future research

Our findings suggest that, in case out-of-home care is inevitable, treatment foster care is the preferred option for placement. This finding is in line with the critiques stating that treatment within a family setting is preferred (James, 2017). However, since for some adolescents their immediate safety is threatened and less intensive types of treatment (e.g., foster care, residential care) have failed to decrease the risks, placement in SRC seems unavoidable sometimes.

To improve the outcome of treatment in SRC for adolescents, the treatment should be tailored to their risks and needs (Andrews & Bonta, 2007). The findings of our study showed that maladaptive emotion regulation, PTSD symptoms, perceived competence and parenting problems were related to behavioral problems for both boys and girls, and therefore should be addressed in treatment to diminish adolescents' behavioral problems. PTSD symptoms for instance, can be targeted by EMDR (Eye Movement Desensitization and Reprocessing)

(Rodenburg et al., 2009) or trauma-focused cognitive behavioral therapy (Lenz & Hollenbaugh, 2015). Perceived competence can be improved by offering Youth Empowerment Programs (YEPs) (Morton & Montgomery, 2013) or Competitive Memory Training (COMET) (Korrelboom et al., 2011). Lastly, emotion regulation can be improved through cognitive behavioral therapy (Braet et al., 2014). Since the seriousness and the presence of risk factors at admission to SRC seem to differ between boys and girls, offering gender-specific care seems appropriate. Consequently, treatment for girls should address PTSD symptoms, perceived competence, and maladaptive emotion regulation. For boys, specific attention for family problems seems essential. Moreover, to optimize SRC outcomes, treatment should be tailored to the individual risks and needs of the adolescent by offering therapy effective in decreasing these risks and in improving strengths.

Current criticism of the approach used in SRC is that there is too much focus on the individual adolescent, without taking their social environment into account (Wessels & Van Eersel, 2021). Therefore, extensive screening to determine the presence and seriousness of risk factors in adolescents and their surroundings referred to SRC is highly recommended. Furthermore, extensive screening of the seriousness of behavioral problems is also recommended since a significant decrease of behavioral problems during an SRC placement is mainly seen in adolescents with the most severe behavioral problems at admission. Furthermore, no change or even deterioration can be seen especially in adolescents who have no behavioral problems upon admission. Consequently, organizations offering SRC should establish clear criteria for placement that adolescents should meet.

Another possible way to improve the effectiveness of SRC is by offering treatment within small-scale facilities. Offering treatment within living groups (residential care) of a maximum of four adolescents and three or four different care group workers, whereas eight or nine different care group workers per group is common practice in SRC, shows promising

results: care group workers in small-scale facilities were able to establish a more positive working alliance with the adolescents and their parents, adolescents experienced a more positive relationship with their peers, and care group workers were able to establish a more positive living group climate in small-scale facilities compared to SRC (Nijhof et al., 2020).

Lastly, when SRC is inevitable, our findings show that a SRC placement should be limited to a duration of six months and that follow-up and aftercare should be improved to preserve the more positive results at discharge linked to a relatively long stay in SRC.

Future research should, first of all, gain more insight into criteria for placement in SRC, by exploring the associations between adolescents' characteristics (e.g., behavioral problems, motivation, family context, age) and the outcomes after treatment, in a much larger sample. Secondly, although we already presented some findings on the possible added value of gender-specific care in Chapter 5, it is necessary to gain more insight into the beneficial effects of tailor-made treatment of both boys and girls, to improve the outcomes of SRC for these adolescents. Regarding girls for example, it would be beneficial to study adolescent girls receiving treatment in a girls-only facility with a regular approach and compare the outcomes to those of girls receiving treatment in a girls-only facility with a gender-specific approach (i.e., using a trauma sensitive approach and aimed at improving perceived competence and decreasing maladaptive emotion regulation). It is highly recommended to include treatment integrity, social climate and the expertise of the care group workers in the analyses.

Third, researchers should focus on evaluating the appropriateness of potential alternative interventions to SRC (e.g., small scale residential facilities, foster care, intensive family treatment). Knowledge should be gained on how alternative interventions can be developed for youth who depend on residential youth care because of their severe problem behavior or due to safety reasons. Gaining knowledge about the way alternative interventions can meet the treatment needs of these youths, and how their social environment may be

supported and strengthened is important to prevent residential placement. So far, homebased treatment has shown to be not flexible enough and cannot be used quickly enough to serve as an alternative to SRC. Furthermore, the expertise to treat severe behavioral problems in homebased treatment is lacking. Furthermore, referring agencies overestimate the appropriateness of SRC due to a lack of alternative interventions (Wessels & Van Eersel, 2021). To serve as a possible alternative to SRC knowledge is necessary on the way (foster) families or family-style group care can be supported to overcome the risks of placement breakdown. Since the TFCO-A-method showed promising results (chapter 2) for adolescents very similar to the ones who participated in this study, the potential of TFCO-A for adolescents referred to SRC should be explored more thoroughly.

When a placement is SRC is unavoidable, in the interest of the adolescent the placement duration should be limited. Our findings do not provide sufficient insight into the reason for whether adolescents are discharged from SRC. More in-depth research, for example by using mixed methods single case research (MMSCR) (i.e., by integrating quantitative and qualitative research methods) (Onghena et al., 2019), into reasons for terminating treatment in SRC, could reveal explanations for the differing treatment duration of SRC between adolescents. Furthermore, as we can see from our findings, intensive screening is necessary to be able to decide whether SRC is the most suitable type of care for an adolescent, and it helps to determine whether treatment is still effective after a certain period. Since intensive screening at admission and over time is not yet common practice in SRC, future research can help gain knowledge about how to effectively implement this philosophy into every level of a youth care organization.

Conclusion

Based on the findings of this dissertation we can conclude that for some adolescents referred to SRC, alternative interventions (e.g., TFCO-A and HBT) appear to have similar or even more positive treatment effects regarding behavioral problems (e.g., externalizing behavioral problems, internalizing behavioral problems and substance abuse). Therefore, these interventions seem more appropriate for some of the adolescents now referred to SRC. However, TFCO-A and HBT are not always available or suitable for those adolescents facing the most severe threat to their physical and mental health, or repeatedly withdraw from the help they need. In those cases, placement in SRC seems unavoidable at this point. Given the presumed iatrogenic effects of SRC and our findings showing a significant part of the adolescents failing to improve or even deteriorate during placement, SRC should never be the first option of choice. Consequently, suitable alternative interventions should be developed for the adolescents currently in need of SRC.

The Dutch government recently reported that they intend to completely abolish secure residential care by 2030 and replace it with small-scale residential facilities (Central Government, 2022). The main goal of this dissertation was to gain knowledge about the provision of tailor-made help for adolescents displaying severe behavioral problems. Until suitable alternative interventions are available, the most vulnerable adolescents keep depending on treatment in SRC. SRC can only be abolished in 2030 when suitable alternative interventions are highly available, even for the most vulnerable adolescents, with the most severe problem behavior, the highest risk to their safety and the most persistent care avoiders. Regarding the development of alternative, less restrictive types of care, the safety of the adolescents must be guaranteed and it must be prevented that adolescent withdraw themselves from the necessary care. Establishing a positive working relationship between staff, the adolescent and his or her family needs to be prioritized to achieve relational safety and to improve the treatment

motivation of the adolescent. Staff needs to stay away from repressive practices, as these are disastrous for the working relationship (De Valk et al., 2015).

Therefore, facilities should be facilitated do develop alternative interventions and supplement SRC with (evidence-based) outpatient care (e.g., family therapy) and high-quality aftercare, as long as there are adolescents depending on SRC. After all, each adolescent is unique and the treatment should suit his or her unique risks and needs, including those of the family and broader network.

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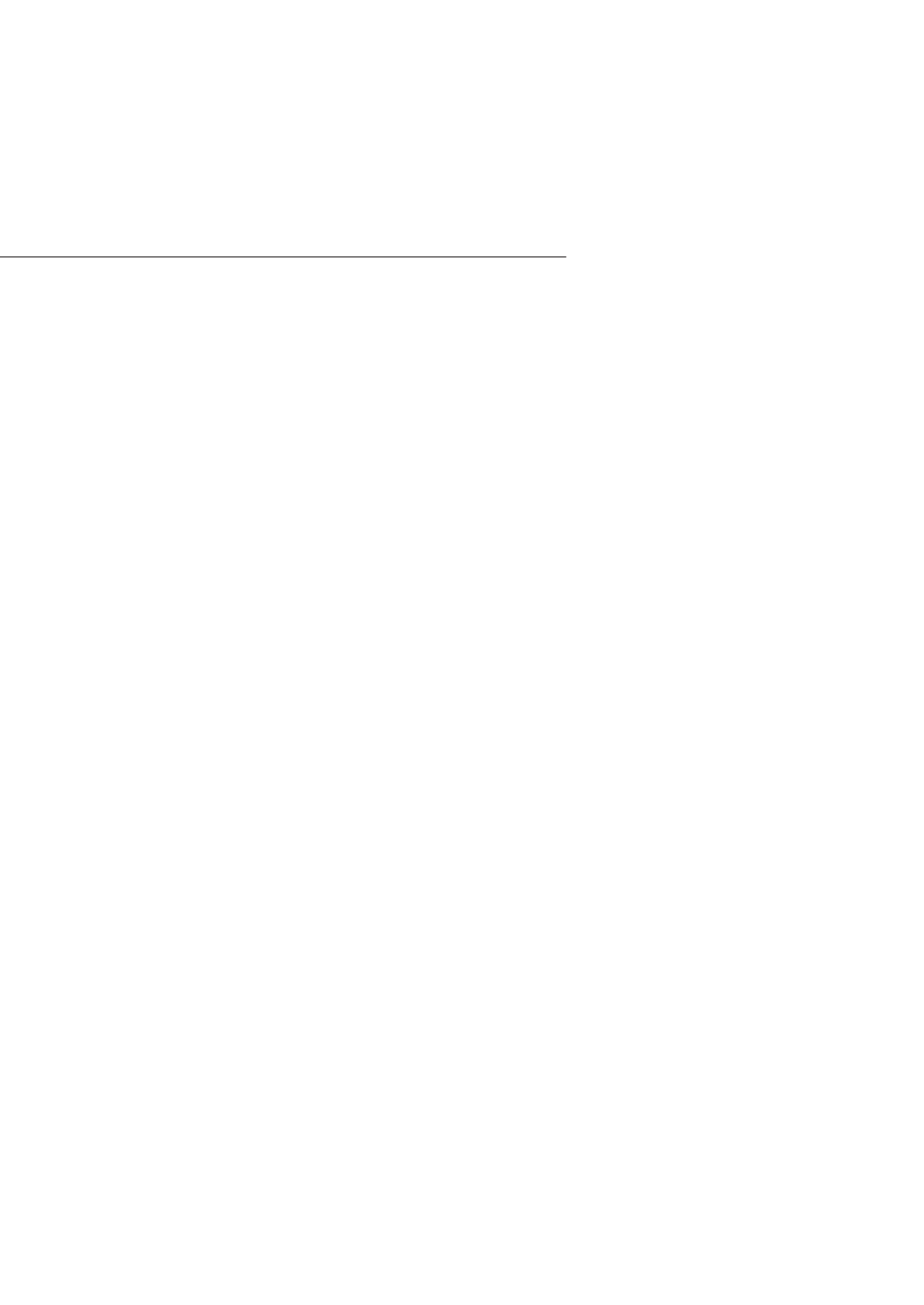
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SUMMARY

Summary

Secure residential youth care (SRC) offers help to children and adolescents with behavioral problems for whom less intensive help proved to be insufficient (Eltink et al., 2017; Martin et al., 2017). Although research has shown that SRC can lead to a decrease in behavioral problems (De Swart et al., 2012; Strijbosch et al., 2015), this form of care has also received criticism (James, 2017; Souverein et al., 2013; Van IJzendoorn et al. al., 2020; Weis et al., 2005). For some children and adolescents, SRC seems to be counterproductive and may even worsen behavior problems through deviancy training or negative influence by peers (Souverein et al., 2013; Weis et al., 2005). Another criticism concerns the autonomy restriction of adolescents and the fact that young people are placed out of their home, away from their family and network, into a residential setting (James, 2017; Ryan & Deci, 2017).

However, many youth care institutions appear to be highly motivated to improve the help offered in the SRC. For example, help is increasingly offered in collaboration with parents and the social network. Moreover, SRC institutions try to treat the youth in an increasingly less restrictive setting and an attempt is made to develop tailor made interventions. Also, institutions aim to develop alternative forms of care for this target group (e.g., intensive treatment foster care, small-scale residential living groups, and short-term placements in residential care in combination with family interventions). Gender-specific care is an attempt to customize treatment in youth care institutions to meet the needs and risks of children and adolescents. This is in line with the assumption that boys and girls have different needs and risks when they enter SRC (Handwerk et al., 2006; Nijhof, 2011; Sonderman et al., 2015; Weis et al., 2005).

This dissertation attempts to investigate the effectiveness of possible alternative interventions to SRC, to clarify the treatment needs of boys and girls and to demonstrate the possible added value of gender-specific help, in order to find possible solutions to make the help to this vulnerable target group more suitable and effective.

The first study (**Chapter 2**) contains a meta-analysis on the effects of residential youth care on behavioral problems (i.e., total, internalizing, and externalizing behavioral problems, substance abuse and delinquency). The effects of residential youth care were compared to the effects of non-residential interventions (i.e., Treatment Foster Care Oregon for Adolescents (TFCO-A) and Intensive Home-Based Treatment (IHBT)).

The aim of the study was to explore the effectiveness of non-residential interventions, as alternative interventions to SRC, as a possible solution for the phasing out of SRC. Results indicated that, on average, the effects of TFCO-A (i.e., a decrease in behavioral problems), where most positive. The results of IHBT and residential youth care did not differ statistically significantly.

Although TFCO-A showed the most positive results, three important remarks are: (1) TFCO-A is not readily available for the placement of the relevant target group, (2) the safety of juveniles cannot always be sufficiently guaranteed in the IHBT, and (3) in a significant part of the studies analyzes were performed by 'matching' similar children and adolescents. Children and adolescents with the most severe problems were mainly present in the residential care population and therefore left out of the comparison. Given these remarks, it seems that currently there are children and adolescents for whom SRC is the most suitable place for treatment. To prevent youth to enter SRC, alternative interventions must be sufficiently available and more suitable types of care must be (further) developed. Furthermore, moderation analyzes showed the effectiveness of residential care compared to non-residential care did not depend on the measurement methods used in the studies or on the characteristics of the youth, indicating that the results of TFCO-A are, on average, more positive compared to those of residential care for all types of youth and all types of problem behavior included in the studies (i.e., total, internalizing, and externalizing behavioral problems, substance abuse and delinquency).

In **chapter 3**, we present a study on the treatment needs and risk factors of adolescents in SRC. In particular, the similarities and differences between boys and girls are explored. More knowledge about the treatment needs and risk factors provides a basis for tailoring the treatment in SRC to the needs of the adolescents. In line with the RNR (risk, need and responsivity) principles by Andrews and Bonta (2010), a more tailored treatment should lead to better results. The study demonstrated that boys and girls do indeed differ in the presence of certain risk factors, although many similarities were also found. PTSD symptoms, maladaptive emotion regulation, a worrisome perceived competence and internalizing problems were found to be more severe in girls than in boys. Boys, however, experienced more severe externalizing behavior problems, a more problematic parent-child relationship, and their parents experienced more parenting problems than the girls' parents. In addition, the study proved that certain risk factors of adolescents in SRC are indeed related to behavioral problems and thus can be used in treatment to decrease problem behavior. Maladaptive emotion regulation, PTSD symptoms, competence perception and parenting problems were found to be related to the display of (more serious) behavioral problems.

In the **fourth chapter** reports on a study that aimed to explore the treatment effectiveness of SRC for 239 adolescents with behavioral problems. More specifically, to analyze changes in total, internalizing and behavioral problems, PTSD symptoms, emotion regulation, competence perception and problems in the family between the time of admission and the time of discharge and between the time of admission and follow-up (six months after discharge). The effects were compared between girls in gender-specific SRC, girls in regular SRC and boys in regular SRC. At the group level, gender-specific care for girls appeared to establish the most favorable results in the reduction of externalizing problems. However, with regard to the other outcome measures, the effectiveness between the different forms of care and between boys and girls appeared to be very similar.

In addition, on the individual level, the progress rates on the different outcome measures ranged from 0% (maladaptive emotion regulation of girls in gender-specific care) to 58% (externalizing behavioral problems of girls in gender-specific care). Moreover, no change of problems over time was seen in 25% (externalizing behavioral problems of girls in regular care) to 88% (maladaptive emotion regulation of girls in gender-specific care) and 0% (perceived competence of girls in gender-specific care) to 39% (internalizing behavioral problems of boys in regular care) showed an exacerbation of their problems.

The results provide limited evidence for the added value of gender-specific programs. Regular SRC appears to be just as effective for boys as for girls. Finally, the results are in line with criticisms stating that SRC can be harmful for some adolescents, as evidenced by the exacerbation of problems that is visible in some adolescents. However, especially adolescents with the most serious problems seem to benefit from placement in SRC.

A study into the effectiveness of secure residential youth care based on single case experimental designs (SCEDs) is described in **chapter five**. Forty adolescents placed into SRC completed a questionnaire every two weeks until discharge on their internalizing and externalizing behavioral problems and their attention problems. Two-level regression analyzes showed that 43% of adolescents experienced a statistically significant reduction in their overall behavioral problems. Regarding externalizing behavior problems, 18% of the adolescents exhibited a decrease. Furthermore, 25% of the adolescents showed a decrease in the internalizing behavior problems and 23% of them in their attention problems. Due to the high percentage of adolescents who experienced no change of their problems or even experienced a worsening of their problems, no statistically significant changes of their problems over time could be observed at the group level. In addition, the duration of treatment did not appear to influence the treatment effect. By intensively monitoring the behavioral problems of the adolescents over time, the way the problems change during the placement in

Summary

SRC can be observed. Four patterns were discovered: a gradual decrease in the problems over time, a gradual increase in the problems over time, no change in the problems over time, and what we called the U-shape: a decrease in the problems of the adolescents during the first months of the placement and an increase (or relapse) of problems after the first months. For the latter group in particular, shortening the placement in SRC seems to be of added value. To be able to anticipate this, intensive screening of behavioral problems is necessary.

As a final conclusion, interventions such as TFCO-A and IHBT show better, or at least comparable treatment outcomes compared to residential care. However, some adolescents are so threatened in their safety, and/or they withdraw from the care they need, that placement in SRC still seems unavoidable. There are various possible solutions to increase the effectiveness of treatment in SRC. For example, the provision of residential care in small-scale facilities has shown promising outcomes (Nijhof et al., 2020). In addition, to improve outcomes the treatment should be in line with the (dynamic) individual risk and protective factors of the adolescents in care (Bonta & Andrews, 2007). We found that especially maladaptive emotion regulation, PTSD symptoms, perceived competence and parenting problems of adolescents show statistically significant associations with behavioral problems and treatment should therefore be aimed at these factors. In particular, PTSD symptoms occur in a significant part (36%) of the SRC population.

This dissertation provided only limited evidence for the added value of gender-specific aid. Although gender-specific help certainly seems to be an important solution direction to increase the effectiveness of SRC, individual tailor-made help seems to be most suitable for the widely varying needs within the population.

Appendices

SUMMARY IN DUTCH
(NEDERLANDSE
SAMENVATTING)

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CURRICULUM VITAE

AUTHOR'S LIST OF
PUBLICATIONS

Nederlandse samenvatting

JeugdzorgPlus biedt hulp aan jongeren met gedragsproblemen voor wie minder intensieve hulp ontoereikend is gebleken (Eltink et al., 2017; Martin et al., 2017). Hoewel uit onderzoek is gebleken dat JeugdzorgPlus voor een afname in gedragsproblemen kan zorgen (De Swart et al., 2012; Strijbosch et al., 2015) ontvangt deze zorgvorm veel kritiek (James, 2017; Souverein et al., 2013; Van IJzendoorn et al., 2020; Weis et al., 2005). Voor sommige jongeren zou de zorgvorm contraproductief werken en zouden zij er beschadigd uitkomen (De Valk et al., 2015). Deviantie training, negatieve beïnvloeding door *peers*, is hiervoor een belangrijke reden (Souverein et al., 2013; Weis et al., 2005). Daarnaast zorgt ook de beperking van de autonomie van jongeren voor kritiek, evenals het feit dat jongeren uit huis worden geplaatst, weg van hun vertrouwde omgeving, familie en netwerk, in een residentiële instelling (James, 2017; Ryan & Deci, 2017).

Veel jeugdzorginstanties blijken echter ten zeerste gemotiveerd om de hulp die in de JeugdzorgPlus geboden wordt te verbeteren. Zo wordt de hulp steeds vaker aangeboden in samenwerking met de ouders en eventueel de bredere sociale kring. Verder proberen JeugdzorgPlus-instellingen de jeugdigen te behandelen in een steeds minder restrictieve setting en om individueel maatwerk te bieden. Ook worden er alternatieve zorgvormen voor deze doelgroep ontwikkeld, waaronder intensieve behandelpleegzorg, kleinschalige woongroepen en kortdurende plaatsingen in combinatie met gezinsinterventies. Een vorm van maatwerk waarmee sommige jeugdzorginstellingen tegemoet proberen te komen aan de behoeften en het verminderen van risico's van jongeren is het bieden van genderspecifieke hulp. Jongens en meiden zouden verschillende behoeften en risico's hebben wanneer zij instromen in de JeugdzorgPlus (Handwerk et al., 2006; Nijhof, 2011; Sonderman et al., 2015; Weis et al., 2005).

Dit proefschrift tracht de veelbelovendheid van alternatieve interventies voor JeugdzorgPlus in kaart te brengen, behandelbehoeften van jongens en meisjes te verhelderen

en de mogelijke meerwaarde van genderspecifieke hulp aan te tonen, om zo tot oplossingsrichtingen te komen om de hulp aan deze doelgroep passender en werkzamer te maken.

De eerste studie (**hoofdstuk 2**) betrof een meta-analyse naar de effecten van residentiële jeugdhulp ten aanzien van gedragsproblemen (i.e., totale, internaliserende en externaliserende gedragsproblemen, drugsmisbruik en delinquentie). Deze effecten werden in de analyse vergeleken met de resultaten die worden bereikt in de niet-residentiële jeugdhulp (i.e., TFCO-A en IHBT). Het doel van de studie was om de effectiviteit van niet-residentiële interventies te verkennen als mogelijke oplossingsrichting voor de afbouw van JeugdzorgPlus. In de studie werd aangetoond dat gemiddeld genomen de effecten van TFCO-A, geoperationaliseerd als een afname van gedragsproblemen, het meest gunstig blijken te zijn. De resultaten behaald middels IHBT en residentiële jeugdzorg wijken niet statistisch significant van elkaar af. Drie belangrijke aanvullingen hierbij zijn: (1) TFCO-A is niet altijd afdoende beschikbaar voor de plaatsing van de betreffende doelgroep, (2) in IHBT is de veiligheid van jeugdigen niet altijd voldoende te garanderen en (3) in de studies waarbij vergelijkende analyses werden verricht middels ‘matching’ bleken de jongeren met de meest ernstige problematiek, veelal aanwezig in de JeugdzorgPlus, buiten de analyses te vallen door het matchingsproces. Het lijkt op basis van deze aanvullingen gerechtvaardigd te zeggen dat op dit moment er nog steeds jongeren zijn waarvoor JeugdzorgPlus de meest passende plek is. Wel benadrukt de relatief gunstigere uitkomsten van niet-residentiële hulp het belang dat alternatieve plekken afdoende beschikbaar dienen te zijn en dat er voldoende alternatieve zorgvormen (door)ontwikkeld dienen te worden. Moderatie-analyses toonden dat de resultaten niet afhankelijk waren van de meetmethoden en de eigenschappen van de jeugdigen.

In **hoofdstuk 3** presenteren we een studie naar de behandelbehoeften en risicofactoren van jongeren in JeugdzorgPlus. In het bijzonder worden de overeenkomsten en verschillen

tussen jongens en meisjes op dit gebied verkend. Meer kennis over de behandelbehoeften en risicofactoren biedt een basis voor het passender maken van de behandeling in JeugdzorgPlus op de zorgvraag. In navolging van de RNR-beginselen (*risk, need and responsivity*) (Andrews & Bonta, 2010) zou een passender aanbod tot betere resultaten moeten leiden. Middels de studie is duidelijk gemaakt dat jongens en meiden inderdaad verschillen voor wat betreft de aanwezigheid van bepaalde risicofactoren en krachten, hoewel er ook veel overeenkomsten werden gevonden. PTSS-symptomen, maladaptieve emotieregulatie, een zorgelijke competentiebeleving en internaliserende problemen bleken ernstiger bij meiden dan bij jongens. Jongens echter ervoeren ernstiger externaliserende gedragsproblemen, een meer problematische ouder-kind relatie en hun ouders ervoeren meer problemen in de opvoeding dan ouders van de meiden. Daarnaast werd in de studie duidelijk gemaakt hoe bepaalde factoren van jongeren samenhangen met gedragsproblemen en bieden zodoende aanknopingspunten voor de inzet van het behandelaanbod. Maladaptieve emotieregulatie, PTSS-symptomen, competentiebeleving en opvoedproblemen bleken gerelateerd aan het vertonen van (ernstigere) gedragsproblemen en vormen dus mogelijke aanknopingspunten om middels behandeling gedragsproblemen te doen afnemen.

In het **vierde hoofdstuk** is verslag gedaan van de derde studie. Deze studie was erop gericht om de behandel-effectiviteit van JeugdzorgPlus voor 239 adolescenten met gedragsproblemen te verkennen. Meer specifiek was de studie erop gericht om veranderingen in totale, internaliserende en gedragsproblemen, PTSS-symptomen, emotieregulatie, competentiebeleving en problemen in het gezin te analyseren tussen het moment van plaatsing en het moment van uitstroom uit de zorg en tussen het moment van plaatsing en follow-up (zes maanden na uitstroom). Hierbij zijn de effecten vergeleken tussen meiden in genderspecifieke zorg, meiden in reguliere JeugdzorgPlus en jongens in reguliere JeugdzorgPlus. Op groepsniveau bleek genderspecifieke zorg voor meiden de meest gunstige resultaten teweeg te

brengen in de vermindering van externaliserende problematiek. Ten aanzien van de andere uitkomstmaten bleek de effectiviteit tussen de verschillende zorgvormen en tussen jongens en meiden echter zeer vergelijkbaar. Op individueel niveau varieerde de succespercentages van 0% (maladaptieve emotieregulatie van meiden in genderspecifieke zorg) tot 58% (externaliserende gedragsproblematiek van meiden in genderspecifieke zorg).

Een aanzienlijk deel van de jongeren lieten geen verandering zien in hun problematiek. De percentages varieerden hier van 25% (externaliserende gedragsproblematiek van meiden in reguliere zorg) tot 88% (maladaptieve emotieregulatie van meiden in genderspecifieke zorg). Daarnaast toonde de studie aan een verergering van de problemen waar te nemen was bij 0% (competentiebeleving van meiden in genderspecifieke zorg) tot 39% (internaliserende gedragsproblematiek van jongens in reguliere zorg). De resultaten toonden slechts beperkt bewijs voor de meerwaarde van genderspecifieke hulp. Reguliere gesloten zorg blijkt even effectief voor jongens als voor meiden te zijn. Tenslotte zijn de resultaten in lijn met kritieken dat JeugdzorgPlus voor sommige adolescenten schadelijk kan zijn, getuige de verergering van problemen die bij een deel van de adolescenten zichtbaar is. Met name adolescenten met de meest ernstige problematiek lijken te profiteren van plaatsing in JeugdzorgPlus.

Een studie naar de effectiviteit van JeugdzorgPlus op basis van single case experimentele designs (SCEDs) is beschreven in **hoofdstuk vijf**. Veertig adolescenten geplaatst in JeugdzorgPlus hebben tot aan hun vertrek iedere twee weken een vragenlijst ingevuld over hun internaliserende en externaliserende gedragsproblemen en hun aandachtsproblemen. Two-level regressieanalyses hebben aangetoond dat 43% van de adolescenten een statistisch significante afname van hun totale gedragsproblemen doormaakten. Ten aanzien van de externaliserende gedragsproblemen betrof dit 18% van de adolescenten, voor 25% van de adolescenten was een afname in de internaliserende gedragsproblemen waar te nemen en voor 23% van hen in hun aandachtsproblemen. Door het hoge percentage adolescenten dat geen

verandering doormaakte, of zelf een verslechtering van de problemen kende waren er geen statistisch significante veranderingen over tijd in de problemen op groepsniveau waar te nemen. Aanvullend bleek de behandelduur niet van invloed te zijn op het behandelresultaat. Door de gedragsproblemen van de adolescenten intensief te monitoren over tijd werd ook zichtbaar hoe de verandering van problemen verloopt tijdens de plaatsing. Er werden vier patronen ontdekt: een geleidelijke afname van de problemen over tijd, een geleidelijke toename van de problemen over tijd, geen verandering van de problemen over tijd en wat wij noemde de U-vorm: een afname van de problemen gedurende de eerste maanden van plaatsing en een toename (of terugval) van de problemen na verloop van tijd. Met name voor deze laatste groep lijkt een verkorting van de plaatsing in JeugdzorgPlus van meerwaarde te kunnen zijn. Om hierop te kunnen anticiperen is intensieve screening van gedragsproblemen noodzakelijk.

Concluderend over de gehele dissertatie laten interventies als TFCA-A en IHBT betere of vergelijkbare behandelresultaten zien als residentiële hulp. Sommige jongeren worden echter zodanig in hun veiligheid bedreigd, en/of zij onttrekken zich aan de zorg die ze nodig hebben, dat een plaatsing in JeugdzorgPlus momenteel nog onafwendbaar lijkt. Om de effectiviteit van behandelingen in JeugdzorgPlus te vergroten bestaan er verschillende oplossingsrichtingen. Zo heeft het aanbieden van residentiële hulp in kleinschalige voorzieningen veelbelovende uitkomsten laten zien (Nijhof et al., 2020). Daarnaast dient de behandeling aan te sluiten op de (dynamische) individuele risico- en beschermende factoren van de adolescenten in zorg om de effectiviteit te vergroten (Bonta & Andrews, 2007). Wij ontdekten dat met name maladaptieve emotieregulatie, PTSS-symptomen, competentiebeleving en opvoedproblemen van adolescenten statistisch significante samenhang vertonen met gedragsproblemen en de behandeling bijgevolg op deze factoren gericht zou moeten zijn. In het bijzonder PTSS-symptomen komen in een aanzienlijk deel (36%) van de JeugdzorgPlus-populatie voor.

Dit onderzoek leverde slechts beperkt bewijs voor de meerwaarde van genderspecifieke hulp. Hoewel genderspecifieke hulp zeker een belangrijke oplossingsrichting lijkt te zijn om de effectiviteit van de JeugdzorgPlus te vergroten, lijkt individuele ‘tailor made’ hulp het meest passend te zijn voor de sterk variërende behoeften binnen de populatie.

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Curriculum vitae

Raymond Vincent Gutterwijk was born at January 20th, 1985 in Purmerend, the Netherlands. In 2004 he graduated from secondary school ('Atheneum') at Jan van Egmond College in Purmerend. In 2006 he attended Erasmus University Rotterdam to study Criminology where he obtained his Bachelors' degree in 2009. He continued in the Masters' program of 'Youth, society and crime' at Erasmus University. He graduated in 2011 from the Masters' program. After working at the Dutch Research Institute of Crime and Law Enforcement (in Dutch: NSCR) as an interviewer for a short period of time, Raymond started working at secure residential care institution De Vaart in Sassenheim (which was part of Horizon Youth Care and Special Education), as a treatment reporter. In 2014, he started working as a researcher for Horizon in Rotterdam (which later became part of iHUB, alliance of youth care, mental health care and special educational organizations). In 2017, he started to combine his practical research at Horizon with his Ph.D. program at Erasmus University Rotterdam. In 2021 Raymond combined his work at iHUB with a position of senior researcher at the Academic Workplace Youth at Risk (in Dutch: AWRJ) for a period of six months. In 2022, Raymond left iHUB and switched to the municipality of Rotterdam, where he now works as a policy advisor to monitor the quality and outcomes of welfare work in Rotterdam.

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