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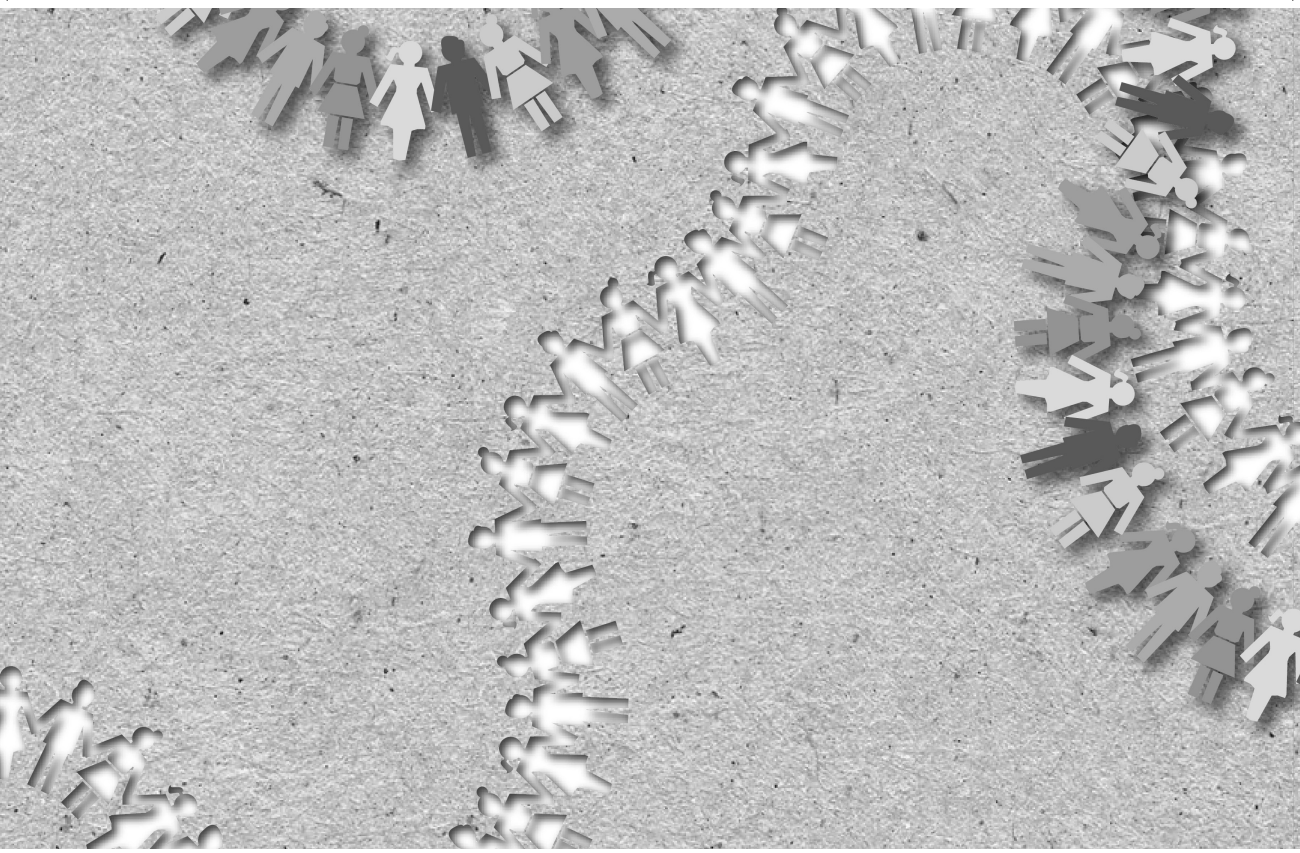


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**Longitudinal relation between parent-team
alliance, parental stress, and child' symptoms
in child semi-residential psychiatry**

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ABSTRACT

Admitting a child to (semi-) residential treatment is stressful for parents, advocating for a profound investment in the parent-team therapeutic alliance. A strong parent-team alliance may result in reduced parental stress which is considered to contribute to a child's symptom improvement during semi-residential treatment. Therefore, the aim of this study was to examine the longitudinal relation between the parent-team therapeutic alliance, parental stress and child symptoms in a child semi-residential setting. Parents and team members filled out questionnaires, in three month intervals, during the semi-residential treatment of 46 children aged 6 to 12 years. Symptoms were assessed with the Strengths and Difficulty Questionnaire, parental stress with the Parenting Stress Questionnaire and parent-team alliance with the Working Alliance Inventory, revised short version. Multilevel analyses showed a significant longitudinal association between the parent-team alliance, parental stress and child's symptoms. A positive change in the parent-team alliance was related to a positive change three months later in the child's symptoms and not the other way around. A focus on the parent-team alliance offers a substantial opportunity for treatment team members to stimulate parents' adjustment to and investment in their child's (semi-) residential treatment. Future research should investigate if strengthening the parent-team alliance results in a shorter treatment duration and thus increases cost-effectivity.

INTRODUCTION

Establishing a strong parent-team alliance in a child psychiatric (semi-) residential setting is challenging as many parents, with an admitted child, experience vulnerable emotions (Geraghty et al., 2011; Gross & Goldin, 2008; Scharer, 1999). While they are relieved and grateful for receiving professional care, they often experience feelings of guilt, loss, distress, anxiety, physical and mental exhaustion (Mohr & Regan-Kubinski, 2001; Puotiniemi, Kyngäs, & Nikkonen, 2001). Parents can experience real or imagined stigma from the wider community and often feel uncertain about how to discuss their child's illness with their surroundings (Geraghty et al., 2011). In addition, they are likely to experience practical challenges associated with frequent appointments with team members or visiting their children. Often parents have formed negative expectations, based on earlier experiences with the mental health care system, which influence the parent-team alliance from the point of admission (Scharer, 2000). The parent-team therapeutic alliance in a semi-residential setting is conceptualized as involving four components: an affective relationship, mutual insight into the problems and possibilities for change and agreement on the goals and tasks of treatment (Lamers & Vermeiren, 2014). Parents with high stress levels are hypothesized to encounter difficulties in forming a strong alliance with the treatment team, which may lead to a less effective treatment environment for their child.

Parents of children with psychiatric disorders rely on clinicians for support, affirmation, and collaboration (Jakobsen & Severinsson, 2006; Scharer, 2002). Evidence suggests, however, that parents are frequently disappointed during (semi-) residential admission of their child (Sarajärvi, Haapamäki, & Paavilainen, 2006; Scharer, 1999) and can feel disrespected or negatively judged by providers (Kerkorian, Bannon, & McKay, 2006; Scharer, 2000). Parents have reported that services can be negative or even hostile in response to the parents' wish to collaborate in the care of their child (Jakobsen & Severinsson, 2006). Interviews with parents in residential psychiatry revealed that half of the parents indicated the need for more support from health care personnel (Puotiniemi et al., 2002). Not surprisingly, there has been an increasing call to focus on strong involvement of parents and strengthening the parent-team alliance in youth psychiatric (semi-) residential settings (Green, 2006; Green et al., 2001). From the literature, parents can be delineated into those that want to be active partners in the design of the treatment plan and want to be recognized in the contribution they make (Geraghty et al., 2011; Scharer, 2002). Several researchers have mentioned, however,

that team members experience challenges in establishing the parent-team alliance, due to the multiple participants involved (Green & Kroll, 1997; Lamers & Vermeiren, 2014) and the complexity of psychopathology (Gross & Goldin, 2008; Horvarth & Bedi, 2002). As the intensity of treatment increases from outpatient to (semi-) residential treatment and as the complexity of the psychiatric disorder increases, difficulties in alliance formations are also likely to increase (Byers & Lutz, 2015). There seems to be a complex interconnectedness shifting over time between the parent-team alliance, parental stress and the child's symptoms within child (semi-) residential treatment.

Research in (semi-) residential settings to date provides only marginal support that the parent-team alliance, parental stress and child's symptoms are linked. Green and colleagues (2001) reported a relation between parent-team alliance and actual symptom improvement, namely a poor parent-team alliance was correlated with high externalizing symptoms of the child. Within a larger sample, the same research team found parent-team alliance to be predictive of improvement in child's general functioning (Green et al., 2007). However, Guzder, Bond, Rabiau, Zerkowitz and Rohar (2011) did not find a significant relation between mother-team alliance and positive child symptom change. In contrast, outpatient youth research consistently showed an association between the parent-clinician alliance and actual symptom improvement (Hawley & Garland, 2008; Kazdin et al., 2006; McLeod & Weisz, 2005). With regards to parental stress, Blader (2006) reported a significant association between reductions in parental stress during admission of a child and improvement in externalizing problems. Unfortunately, these earlier alliance-stress-outcome (semi-) residential studies involved baseline and discharge assessments only. As stress, alliance and child symptoms evolve over the course of treatment and are presumed to be interconnected, there is a need to investigate trajectories (Hawley & Weisz, 2005; Kazdin et al., 2006; Marker, Comer, Abramova, & Kendall, 2013).

The aim of the current study was a longitudinal investigation of the parent-team alliance, parental stress and child's symptoms during (semi-) residential treatment, as these constructs are considered to be interconnected and to mutually influence each other (Green et al., 2007; Rimehaug, Berg-Nielsen, & Wallander, 2012). Multiple assessments of parent-team therapeutic alliance, parental stress and child's symptoms, will provide insight as to how these factors are related and how change in one construct precedes change in another construct. For example, parent-team alliance could be a consequence of symptom improvement rather than a predictor (Shirk et al., 2011).

The same accounts for parental stress, which could be a consequence of a poor parent-team alliance, rather than preceding it. In the current study, it was hypothesized that a positive change in parent-team alliance will precede a positive change in parental stress and child's symptoms. The parent-team alliance is expected to be an important contributor to parents' adjustment to and investment in their child's treatment program.

METHOD

Setting and Participants

Participants in this study were mothers and fathers of children admitted to five semi-residential psychiatric units in two locations in the western urban part of The Netherlands. These semi-residential units offer a multimodal treatment intervention by a multi-professional team, for children with psychiatric disorders who attend at least three days, but usually five days a week. The treatment team consists of group care workers, parent counselors, a licensed clinical psychologist and if indicated a child psychiatrist, and creative, educative, and psychomotor therapists. Around seven children receive treatment per unit and treatment duration is variable. The primary goal of (semi-) residential treatment is to reduce psychiatric symptoms and improve youths' quality of life and well-being.

In total 45 mothers and 38 fathers of 46 children participated. Twenty-six children (56.5%) were treated at treatment location 1 and twenty (43.5%) at treatment location 2. There were 37 boys (80.4%) and nine girls (19.6%). Of the 46 children, 37 (80.4%) lived in a two-parent home and nine children (19.6%) lived in a single-parent home, of which two (4.4%) lived in two single-parent homes (divorced parents with shared custody). Parents' educational level was early/primary level for 2.3% mothers and 2.6% fathers (national data: 8.4%), lower/upper-secondary level for 77.3% mothers and 68.4% fathers (national data: 63.1%) and tertiary/master level for 20.4% mothers and 29% fathers (national data: 27.6%). Forty-four children (95.7%) had two Dutch parents, one child (2.2%) had one Dutch and one non-Dutch parent and one child (2.2%) had two non-Dutch parents. With regards to estimated AXIS I of DSM-IV classification before admission, 65% (28) of the children were classified with an Autism Spectrum Disorder, 26% (11) with a mood or anxiety disorder and 54% with a disruptive behavior disorder (22). Of the 46 children, 45.7% showed comorbidity on Axis I of DSM-IV.

Measures

Parenting stress questionnaire. The Dutch Parenting Stress Questionnaire (PSQ) is a 34-item measure, rated on a 4-point scale from 1=totally disagree to 4=totally agree, assessing the parents' stress levels (Vermulst et al., 2012). The mean score was transformed to a deviation score, with higher scores indicating more parental stress. The result was a total parenting stress score as well as five sub scores: parent-child relationship, competence, depressive moods, role restriction and health. The PSQ is a valid and reliable instrument with both the total score and the sub scores being psychometrically sound. Cronbach's alpha was between 0.89 and 0.91 for the total score and between 0.74 and 0.87 for the subscales (Vermulst et al., 2012). In this study the PSQ was completed, before admission and with three month intervals, by both fathers and mothers independently.

WAV-12R. The WAV-12R is the Dutch adaptation and revision of the Working Alliance Inventory Short version (Lamers, Delsing, van Widenfelt, & Vermeiren, 2015; Stinckens et al., 2009) and measures the therapeutic alliance between parents and team members in a (semi-) residential setting. The questionnaire has three subscales: 'insight' (mutual insight into child's symptoms and change process), 'working' (agreement on goals and tasks of treatment) and 'bond' (the affective relationship). The questionnaire contains 12 items which are rated on a 5-point Likert scale, ranging from 1: 'rarely or never' to 5: 'always.' Cronbach's alpha of the WAV-12R across the three subscales ranged from .84 to .93 (Lamers, Delsing, et al., 2015). The WAV-12R was filled out by mothers and fathers after six weeks of treatment and then at three month intervals during treatment.

Strengths and difficulties questionnaire (SDQ). The Dutch version of the SDQ (Goodman, 2001; van Widenfelt et al., 2003) is a 25-item measure assessing the child's strengths and difficulties. There are three response categories, ranging from 'not true' (0) to 'certainly true' (2). The questionnaire has five subscales (emotional problems, conduct problems, hyperactivity, peer problems, and prosocial behavior) in addition to a total score. The sum of scales 1-4 results in a total difficulty score with a minimum of 0 and a maximum of 40. In contrast to the other scales, a high score on the prosocial scale indicates strengths. The psychometric properties of the SDQ are generally good. Cronbach's alpha was .82 for the parent version of the total score and between .57 and .85 for the subscales (Goodman, 2001). In this study, the SDQ was completed by mothers and fathers before and during admission.

Procedure

Routine Outcome Monitoring (ROM) was implemented as an integral part of the semi-residential treatment, with ROM assessments at three month intervals (Lamers, van Nieuwenhuizen, Siebelink, Blaauw, & Vermeiren, 2015). The research plan, which was part of a larger study, was judged as falling outside the WMO (Dutch Medical Research in Human Subjects Act) by the medical ethical board of the University Medical Center in Leiden. Data were managed in accordance with medical ethical laws in The Netherlands: Personal Data Protection WGBO (Agreement on Medical Treatment Act) and WBP (Personal Data Protection Act). The aim of the larger study was to evaluate the effect of strengthening the therapeutic alliance between parents and clinicians on treatment outcome. One part of the sample (N= 22) received treatment as usual; the other part (N= 24) received additional parent-team alliance strengthening strategies. Informed consent was obtained from all parents during the admission procedure of the child. For the ROM-assessment, parents needed to have sufficient command of the Dutch language. As a result, one referred client was not included in the ROM data collection.

Upon admission, a standard battery of questionnaires was administered to parents to assess demographic variables. This battery also included the Development and Well-Being Assessment (DAWBA; Goodman, Ford, Richards, Gatward, & Meltzer, 2000), filled out by parents and the teacher, to generate a DSM IV classification of the child. The SDQ is part of the DAWBA. The ROM questionnaires were built into a web-based computer software program for ROM, namely Patient-Reported Outcome Measurement Information System (ProMISe). Team members filled out ROM questionnaires electronically, parents had a choice between paper-and-pencil and electronic completion of questionnaires.

Statistical Analyses

With SPSS (version 20.0) means and standard deviations (SDs) were calculated for the alliance, stress and symptom variables over the five assessment times for mother and father reports separately. As the study aimed to include reports of both parents to accommodate for responses from parents within the same dyad, multilevel analysis must be used to account for within family correlation. Furthermore, the correlation between the repeated measurements must be taken into account. Therefore, a three-level multilevel analysis was used. An advantage of multilevel analysis is also that it allows for analysis of a sample with variable amount of assessments between

participants due to different treatment lengths. In the present paper, first, associations were examined between the absolute scores of the alliance, stress and symptom variables, next associations between changes in scores between assessment times were examined. Further analyses were aimed at disentangling the timing of changes by examining which change in one variable precedes the change in another variable. All multilevel analyses were adjusted for age and sex of the child, education level of parents, treatment location and the treatment intervention and were performed in Stata (Statacorp, 2010).

RESULTS

Descriptive Analyses

Descriptive results are presented in Table 1, including means and standard deviations of the stress, alliance and symptom scores over the five assessment times. There are variable N's at the different assessment times due to the fact that the number of children in treatment declined over time. Mothers reported higher stress levels than fathers (56.2-65.8 vs. 52.7-58.2; $p < .01$), however, for both mothers and fathers, stress levels gradually declined during the first four assessments. For fathers, stress related to parenting showed the highest score at start (15.2) and the strongest decline over time (12.3). For mothers, stress related to health showed a strong decline (14.1-11.1). Alliance scores were not different between mothers and fathers (41.0-46.1 vs. 42.1-44.0). During the first three assessment times the parent-team alliance became stronger according to mother and father reports. For children in treatment for more than 9 months, the parent-team alliance declined somewhat at the fourth and fifth assessment time. For both mother and father reports, child's symptoms gradually declined over the five assessment times (22.0-17.8 vs. 21.6-17.4). The only exception was the child's prosocial behavior, which remained relatively stable over the course of treatment.

Association between Parents' Reports of Alliance, Stress and Symptoms

Multilevel analyses showed an association between a strong parent-team alliance, low parental stress levels and low child's symptoms scores of both parents (Table 2). The total score of parent-team alliance was significantly inversely associated with the total score of parental stress ($B = -.14$; $p < 0.01$). The regression coefficient can be interpreted as a difference in one unit in the parent-team alliance was associated with a difference

of $-.14$ units in parental stress, both between and within subjects. On the subscale level, the insight scale of the parent-team alliance was significantly inversely associated with all the parental stress scales.

In addition, total parental stress was significantly positively associated with the total score of parents' reports of child's symptoms ($B = 1.18$; $p < 0.01$). A child's emotional problems in particular were significantly positively associated with all the parental stress subscales. In addition, conduct problems, peer problems, hyperactivity and prosocial behavior were also significantly associated on subscale level.

Last, the total score of the parent-team alliance was significantly inversely associated with the total score of the child's symptoms ($B = -.54$; $p < 0.01$). All the subscales of the parent-team alliance were significantly inversely associated with the total child's symptom score reported by parents. Further, the total parent-team alliance score was significantly inversely associated with child's emotional problems ($B = -.78$; $p < .01$), hyperactivity ($B = -.71$; $p < .05$) and peer problems ($B = -1.05$; $p < .01$).

Associations between Change in Parent-Team Alliance, Stress and Symptom Scores between Assessment Times

In Table 3, multilevel analyses are presented as associations of change in parent-team alliance, change in parental stress and change in symptom scores between the assessment times. With regard to total scores, only change in parent-team alliance was significantly associated with change in the child's symptoms ($B = -.69$; $p < .01$). Most of the subscales showed a significant inverse association between change in parent-team alliance and change in child's symptoms, except for child's peer problems and prosocial behavior. On the subscale level, there were some associations between change in parent-team alliance and change in parental stress. Change in the subscale alliance insight was significantly inversely associated with change in overall stress ($B = -.06$; $p < .01$) and specific to stress related to the child-parent relationship ($B = -.26$; $p < .01$) and parental depression ($B = -.25$; $p < .01$). While no association was found between change of the total stress score and change of child's symptoms total score, the subscale "conduct problems" was significantly positively associated with change in several subscales of parental stress, namely parent-child relationship ($B = .49$; $p < .01$), parenting ($B = .60$; $p < .01$) and depression ($B = .46$; $p < .01$).

Table 1 Descriptive scores for parental stress, parent-team alliance and child’s symptoms for mothers and fathers separately

	Mothers				
	T1	T2	T3	T4	T5
Stress	N=42	N=42	N=32	N=22	N=14
Relation	11.9(3.3)	11.0(3.6)	10.8(3.5)	10.6(3.7)	11.6(3.7)
Parenting	15.3(3.3)	14.8(4.4)	14.3(4.6)	13.7(3.0)	14.4(4.9)
Depression	11.3(2.7)	11.0(2.9)	10.6(3.0)	10.0(2.1)	10.9(2.5)
Role	13.0(5.5)	12.0(5.0)	11.9(5.3)	11.4(0.9)	11.5(5.3)
Health	14.1(4.8)	12.0(3.4)	11.5(3.9)	10.5(2.8)	11.1(3.6)
Total	65.8(13.8)	60.8(14.2)	59.1(16.3)	56.2(12.3)	59.5(15.8)
Alliance	N=35	N=37	N=34	N=20	N=13
Insight	5.5(2.4)	5.3(1.9)	5.6(2.0)	5.9(2.2)	6.0(2.4)
Working	20.5(6.8)	22.9(4.9)	23.9(4.4)	22.9(5.0)	24.1(4.9)
Bond	14.9(4.1)	16.1(3.3)	16.6(3.2)	15.7(3.2)	15.5(3.6)
Total	41.0(11.4)	44.2(8.5)	46.1(8.2)	44.5(9.3)	45.7(9.8)
Symptoms	N=37	N=40	N=33	N=23	N=12
Emotional	5.9(2.9)	5.2(2.5)	5.1(2.5)	4.5(2.4)	4.3(2.4)
Conduct	4.2(2.3)	3.4(2.5)	3.2(2.2)	2.9(1.8)	3.2(1.9)
Hyper	7.4(2.7)	6.9(2.8)	6.3(2.9)	6.1(2.6)	6.9(2.1)
Peer	4.6(2.0)	4.2(2.3)	4.2(2.2)	4.4(2.1)	3.3(1.9)
Prosocial	6.1(2.4)	6.4(2.4)	6.2(2.3)	6.2(2.3)	6.8(2.3)
Total	22.0(5.7)	19.7(5.7)	18.8(6.3)	17.9(5.4)	17.8(5.5)
	Fathers				
	T1	T2	T3	T4	T5
Stress	N=35	N=32	N=25	N=19	N=10
Relation	10.8(3.5)	9.8(3.2)	10.2(3.9)	9.5(2.9)	9.6(3.2)
Parenting	15.2(4.1)	13.6(4.0)	13.1(4.0)	12.7(3.0)	12.3(3.1)
Depression	10.6(2.9)	10.3(3.0)	10.2(3.5)	9.8(3.2)	10.5(3.2)
Role	10.3(4.0)	10.4(4.2)	10.6(4.8)	9.8(5.0)	14.1(6.1)
Health	11.1(3.9)	10.2(2.5)	11.5(4.8)	10.8(4.5)	11.7(6.4)
Total	58.0(14.0)	53.6(13.2)	55.0(15.7)	52.7(13.3)	58.2(17.2)
Alliance	N=28	N=31	N=25	N=19	N=10
Insight	6.0(2.1)	5.6(1.7)	5.8(1.7)	5.7(1.8)	5.6(2.0)
Working	21.5(5.4)	22.8(4.0)	22.6(3.9)	22.4(5.2)	21.7(4.6)
Bond	14.9(3.9)	14.9(3.1)	15.6(2.8)	15.2(3.0)	14.8(1.8)
Total	42.5(10.1)	43.4(7.6)	44.0(7.3)	43.2(9.1)	42.1(7.2)
Symptoms	N=30	N=32	N=27	N=21	N=9
Emotional	5.6(2.7)	5.1(2.5)	5.2(2.7)	4.0(2.7)	4.1(2.2)
Conduct	4.0(1.8)	2.8(1.6)	2.9(1.9)	2.5(1.8)	2.4(2.2)
Hyper	7.2(2.3)	6.8(2.7)	6.0(2.7)	5.9(2.5)	6.6(2.4)
Peer	4.9(2.2)	4.4(2.1)	4.4(2.0)	4.6(2.5)	4.3(2.2)
Prosocial	5.7(2.0)	6.0(1.7)	5.8(1.7)	6.0(2.2)	6.9(1.5)
Total	21.6(5.0)	19.1(4.8)	18.5(6.0)	17.0(6.2)	17.4(6.2)

Note. Values given are means and standard deviations *M(SD)*; T1 = Before intake (Stress and Symptoms); After 6 weeks (Alliance), T2 = 3-4 months, T3 = 6-7 months, T4 = 9-10 months; T5 = 12-13 months. Higher stress scores reflect higher stress levels; higher symptom scores reflect more symptoms (except for the prosocial scale); higher alliance scores reflect stronger alliances.

Disentangling the Timing of Related Changes

To study the association between changes in the parent-team alliance and changes in child's symptoms, multilevel analyses were conducted to create more insight into the timing of the relationship between the changes. The results showed no significant association between the change in child's symptoms between two assessment times and the change in parent-team alliance between the two following assessment times ($B = -.00$; $p = .99$). However, there was a significant inverse significant relationship between a change in parent-team alliance and a change in child's symptoms one time-period further, suggesting that a change in parent-team alliance precedes a change in child's symptoms rather than the other way round ($B = .10$; $p = .04$).

Table 2 Multilevel analysis of associations between parent-team alliance, parental stress and child's symptoms

Stress→ Alliance↓	Relation	Parenting	Depression	Role	Health	Total
Insight	-.17(.04)**	-.12(.03)**	-.17(.04)**	-.10(.03)**	-.06(.03)*	-.04(.01)**
Working	-.17(.10)	-.08(.09)	-.31(.10)**	-.17(.08)*	-.10(.07)	-.05(.02)*
Bond	-.19(.07)**	-.10(.06)	-.26(.07)**	-.14(.06)*	-.04(.05)	-.05(.02)**
Total	-.51(.17)**	-.29(.15)	-.73(.18)**	-.38(.14)**	-.20(.13)	-.14(.04)**
Stress→ Symptoms↓	Relation	Parenting	Depression	Role	Health	Total
Emotional	.38(.10)**	.38(.12)**	.24(.09)**	.26(.13)*	.46(.13)**	1.66(.41)**
Conduct	.66(.13)**	.84(.14)**	.41(.12)**	.15(.16)	.33(.17)	2.38(.52)**
Hyper	.09(.12)	.27(.13)*	.28(.10)**	.15(.14)	.24(.15)	1.18(.46)*
Peer	.22(.12)	.36(.33)**	.15(.11)	.57(.14)**	.02(.15)	1.58(.47)*
Prosocial	-.39(.11)**	-.12(.13)	-.22(.10)*	-.43(.13)**	.20(.15)	-1.01(.45)*
Total	.23(.05)**	.31(.05)**	.19(.04)**	.20(.06)**	.19(.06)**	1.18(.18)**
Alliance→ Symptoms↓	Insight	Working	Bond	Total		
Emotional	-.12(.06)*	-.44(.15)**	-.19(.11)	-.78(.26)**		
Conduct	-.19(.08)*	-.21(.19)	-.03(.14)	-.56(.35)		
Hyper	-.13(.07)	-.30(.16)	-.16(.12)	-.71(.29)*		
Peer	-.19(.07)**	-.49(.17)**	-.36(.12)**	-1.05(.30)**		
Prosocial	.02(.07)	.17(.16)	.12(.12)	.28(.30)		
Total	-.10(.03)**	-.26(.07)**	-.13(.05)**	-.54(.12)**		

Note. Values given are regression coefficients and standard error $B(SE)$; analyses controlled for treatment location, alliance intervention, age and sex of child and SES of parents; T1 = before intake (Stress and Symptoms); after 6 weeks (Alliance), T2 = 3-4 months, T3 = 6-7 months, T4 = 9-10 months; T5 = 12-13 months; * = $p \leq 0.05$; ** = $p \leq 0.01$.

Table 3 Multilevel analysis of associations between change in parent-team alliance, parental stress and child’s symptoms

Δ Stress→ Δ Alliance↓	Relation	Parenting	Depression	Role	Health	Total
Insight	-.26(.07)**	-.10(.05)	-.25(.07)**	-.01(.06)	-.06(.06)	-.06(.02)**
Working	-.19(.17)	.07(.14)	-.27(.19)	.07(.15)	-.05(.14)	-.008(.05)
Bond	-.11(.11)	.00(.09)	-.30(.12)*	-.11(.09)	-.07(.09)	-.04(.03)
Total	-.46(.29)	.03(.23)	-.79(.31)*	-.06(.26)	-.15(.24)	-.09(.09)
Δ Stress→ Δ Symptoms↓	Relation	Parenting	Depression	Role	Health	Total
Emotional	.17(.11)	.19(.14)	.10(.10)	-.17(.11)	.30(.12)*	.41(.35)
Conduct	.49(.15)**	.60(.18)**	.46(.13)**	-.07(.16)	-.05(.16)	1.36(.47)**
Hyper	-.04(.13)	.03(.16)	.11(.11)	-.10(.13)	-.18(.13)	-.27(.39)
Peer	-.05(.14)	.04(.18)	-.07(.12)	.18(.14)	-.02(.15)	.08(.45)
Prosocial	-.07(.17)	-.14(.20)	-.08(.14)	-.09(.17)	.24(.18)	-.12(.51)
Total	.10(.06)	.16(.07)*	.11(.05)*	-.05(.06)	.03(.06)	.28(.19)
Δ Alliance→ Δ Symptoms↓	Insight	Working	Bond	Total		
Emotional	-.20(.08)*	-.58(.18)**	-.12(.14)	-.88(.32)**		
Conduct	-.25(.12)*	-.71(.29)*	-.15(.20)	-1.17(.49)*		
Hyper	-.20(.10)*	-.64(.23)**	-.50(.16)**	-1.50(.38)**		
Peer	.06(.12)	.24(.27)	.06(.19)	.43(.47)		
Prosocial	.12(.13)	.34(.30)	-.12(.21)	.29(.52)		
Total	-.13(.04)**	-.39(.10)**	-.14(.07)*	-.69(.17)**		

Note. Values given are regression coefficients and standard error *B(SE)*; analyses controlled for treatment location, alliance intervention, age and sex of child and SES of parents; T1 = before intake (Stress and Symptoms); after 6 weeks (Alliance), T2 = 3-4 months, T3 = 6-7 months, T4 = 9-10 months; T5 = 12-13 months; * = $p \leq 0.05$; ** = $p \leq 0.01$.

DISCUSSION

The current study investigated the interplay between parent-team alliance, parental stress and child’s symptoms over time in a child semi-residential setting. At three month intervals these constructs were assessed from mother’s and father’s perspectives for 46 children admitted to semi-residential treatment. The main findings were that: (1) parent-team alliance, parental stress and child’s symptoms were significantly related over the course of treatment; (2) positive change in parent-team alliance was

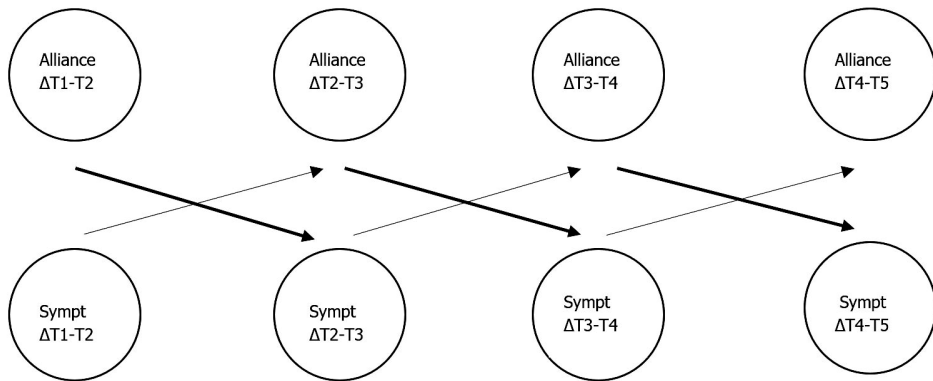


Figure 1 Direction of change between the parent-team alliance and child's symptom improvement. The total scores on the WAV (alliance) and SDQ (symptoms) were used; Sympmt= Symptoms; T1 = before intake (Stress and Symptoms); after 6 weeks (Alliance), T2 = 3-4 months, T3 = 6-7 months, T4 = 9-10 months; T5 = 12-13 months

significant longitudinally related to positive change in child's symptoms and (3) positive change in alliance between two assessments significantly preceded a positive change in child's symptoms at two subsequent assessments. Although parents are viewed by clinicians as crucial in the semi-residential treatment of children, parental constructs have rarely been longitudinally investigated in relation to treatment outcomes in this setting. Our findings underscored that a strong therapeutic alliance between treatment team members and parents is an effective common process factor of child semi-residential treatment, influencing parents' experience of stress and preceding symptom improvement of the child. Therefore, this study contributes to the scientific literature and clinical practice of child semi-residential psychiatry.

Multilevel analyses resulted in a significant longitudinal association between a strong parent-team alliance and low parental stress levels. Parents whose child is admitted to (semi-) residential psychiatry often experience feelings of stress, anxiety and guilt (Geraghty et al., 2011). In this study, the stress of parents was reduced over the course of treatment, which might contribute to parents' ability to invest in the child's treatment program and in re-establishing their home situation with the child. Although qualitative interviews with parents revealed that their stress levels were strongly connected to their relation with the treatment team (Puotiniemi et al., 2002), our findings provided additional empirical proof. Parents' perspective of an affective and collaborative bond with the treatment team members was correlated with their experience of stress throughout the admission of their child. Despite a significant association

between parent-team alliance and parental stress, our expectation, that a positive change in parent-team alliance would be associated with a positive change in parental stress was not confirmed. An explanation might be that other factors, such as the family situation, partner relationship, treatment satisfaction, support and parental coping skills, have more influence on changes in parental stress. There was, however, a significant longitudinal relation between a positive change in parental stress and a positive change in the child's externalizing problems, which corresponds with the results of Blader (2006). Thus, parents reported less stress over time when they experience a reduction in the child's externalizing problems.

A strong parent-team alliance was also significantly longitudinally associated with lower child's symptoms, as shown by multilevel analyses. The shown reduction of child's symptoms over time in this study matched the primary treatment goal of youth semi-residential psychiatry. Surprisingly, as a residential treatment goal is also promoting prosocial behavior of children, child's prosocial behavior remained relatively stable over treatment. A possible explanation might be that this construct is more subject to social desirability of parents. The parent-team alliance was strongly associated with the child's symptoms over time, while scant earlier research on associations between parent-team alliance and child's symptoms was inconsistent in residential settings (Green et al., 2007; Green et al., 2001; Guzder et al., 2011). Examining earlier research in more detail revealed that half of the sample of Guzder and colleagues (2011) failed to complete measures, while in Green's studies (Green et al., 2007; 2001) and this current study all participants completed the questionnaires. A low questionnaire completion rate might have prevented Guzder and colleagues (2011) from finding significant associations. Another explanation might be that in contrast to these earlier studies, in our study the parent-team therapeutic alliance was investigated longitudinally in relation to symptom improvement. We found that a positive change in the parent-team alliance was significantly associated with a positive change in child's symptoms. The interconnectedness of change in the parent-team alliance with change in child's symptoms in a child residential setting, underscored that parent-team alliance is a treatment process factor that deserves substantial clinical attention.

As hypothesized, improvement in parent-team alliance preceded reductions in child's symptoms and not the other way around in a semi-residential treatment setting. These findings contradicted the suggestion that alliance is a consequence rather than a predictor of symptom change (Crits-Christoph, Gibbons, & Hearon, 2006; Shirk et al.,

2011). Youth research disentangling the direction of alliance-outcome change associations has been scarce, especially due to a lack of longitudinal assessments (McLeod, 2011; McLeod & Weisz, 2005; Shirk et al., 2011). Regarding the youth-therapist therapeutic alliance, studies have provided some support that a strong youth alliance is a predictor of symptom change, rather than a consequence (Labouliere, Reyes, Shirk, & Karver, 2015; Ormhaug, Jensen, Wentzel-Larsen, & Shirk, 2014). A study involving 16 week session-by-session ratings found partial support for a reciprocal relationship between youth alliance and symptom improvement (Marker et al., 2013). Our study is the first to investigate the parent-team alliance longitudinally, as the parent alliance is considered to be as important as the youth alliance in relation to youth treatment outcomes (McLeod, 2011). Our finding that stronger parent-team alliance drives symptom reduction, has important clinical implications. (semi-) residential treatment is often described as a black box (Harder & Knorth, 2009) with tailor made and variable treatment modules. The parent-team alliance is, however, a common process treatment factor that for each individual client promotes an effective treatment environment. To improve treatment effectiveness of this relatively costly intervention, an investment in a strong parent-team alliance is a promising treatment element.

In this study the parent-team alliance, rated by mothers and fathers, showed a slight increase during the first nine months of treatment. The group who continued treatment (22 children continued treatment until a year and 14 even longer) scored somewhat lower. Explanations for this decline in the last months might be that parents are disappointed that treatment is not finished yet, that they are already focused on separating themselves from the treatment team or that the team takes the parent-team alliance more for granted. In any event, these fluctuations in the strength of the parent-team alliance, need attention from treatment team members. ROM, the assessment of treatment outcomes at regular intervals in order to monitor clients' progress during treatment (De Beurs et al., 2011), may support clinicians. It is unfortunate, however, that ROM currently mostly focuses on outcome assessment (Hall et al., 2013), while monitoring the parent-team alliance seems to be a promising process factor to evaluate regularly. Our findings add support to the already existing call to routinely monitor the therapeutic alliance in complex treatment services (Bickman et al., 2011; Lamers, Delsing, et al., 2015). Feedback to clinicians and parents about their parent-team therapeutic alliance provides the opportunity for both sides to redirect it. Next to this feedback system around the alliance, treatment team members could invest in specific alliance building strategies. Future research should be aimed at investigating the

effect of strengthening the parent-team alliance in (semi-) residential psychiatry on treatment results and length.

Although the methodology used in the current study provided the opportunity to investigate the interaction between important treatment constructs, some limitations are noteworthy. First, the parent-team alliance, stress and symptoms were measured from mother's and father's perspectives only. Several researchers have shown, however, that alliance, stress and symptom scores can differ between parents and clinicians (Hawley & Garland, 2008; Lamers & Vermeiren, 2014). The perspective chosen might have an influence on the strength of associations between these factors. Therefore, future research may complement parents' reports with therapists' reports. A second limitation is that the clients and their parents in this study formed an alliance with only two treatment teams (at two different locations). In addition, half of the group children (n=22) received an alliance building intervention. Although all analyses were corrected for treatment location and treatment intervention, ratings of the participants may not be fully independent. Third, although multiple subscales per questionnaire resulted in many statistical tests, we did not adjust for multiple testing. Instead, interpretations and conclusions were based on the general overview and not on single significant results. Finally, the size and constituency of our sample may limit the generalizability of the results. Our study involved 46 clients only, of which most had an Axis I autism spectrum disorder, who received treatment from one providing institute. Future studies may include larger samples with clients with more diverse psychopathologies involving different treatment institutions. Larger samples provide the opportunity to further investigate possible moderating factors between parent-team alliance, parental stress and outcome, such as parental motivation, engagement, psychopathology etc.

Semi-residential treatment is an intensive and costly module often provided in child psychiatry. The findings in this study underscore the parent-team alliance as an effective common process factor of semi-residential treatment. The parent-team alliance is interconnected with parents' experience of stress and with the child's symptom improvement over the course of treatment. Although parents might experience a high level of stress due to the admission of their child, they are often willing to invest substantially in the treatment of their child. A strong parental investment in the semi-residential treatment of children, results in an effective treatment environment. An essential task for treatment team members in semi-residential psychiatry is developing strategies to monitor and invest in the parent-team alliance.

