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Published in:
Child and Family Social Work

DOI:
10.1111/cfs.12976

Publication date:
2022

Document Version
Publisher's PDF, also known as Version of record

Link to publication in Tilburg University Research Portal

Citation for published version (APA):
Gutterswijk, R. V., Kuiper, C. H. Z., van der Horst, F. C. P., Jongerling, J., Harder, A. T., & Prinzie, P. (2022). Behavioural problems of adolescents in secure residential youth care: Gender differences and risk factors. *Child and Family Social Work*. https://doi.org/10.1111/cfs.12976

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Download date: 21. Nov. 2022

Received: 19 January 2022 | Revised: 13 July 2022 | Accepted: 15 September 2022

DOI: 10.1111/cfs.12976

ORIGINAL ARTICLE

CHILD & FAMILY SOCIAL WORK WILEY

Behavioural problems of adolescents in secure residential youth care: Gender differences and risk factors

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Funding information
The authors disclosed receipt of the following financial support for publication of this paper: Publication was made possible by the support of the Reformed Civil Orphanage (in Dutch: Gereformeerd Burger Weeshuis), Rotterdam, the Netherlands.

Abstract

Adolescents in secure residential care mostly suffer from serious behavioural problems, often accompanied by trauma and adverse family circumstances. This paper presents findings of a comparison of behavioural problems and risk factors of 255 boys and girls (aged 12 to 18 years) in secure residential care in the Netherlands and their association with behavioural problems. A cross-sectional design and standardized questionnaires were used to measure behavioural problems and individual and familial risk factors. By using independent-sample *t* tests, the severity of these factors in boys and girls was compared, and by using structural equation modelling (SEM), associations between these factors and behavioural problems were investigated. The findings of the study show that post-traumatic stress disorder (PTSD) symptoms, maladaptive emotion regulation, impaired perceived competence and internalizing behavioural problems were more severe in girls than in boys. Boys experienced more severe externalizing behavioural problems and more family problems than girls. Maladaptive emotion regulation, PTSD symptoms, perceived competence and parenting problems were related to behavioural 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.

KEYWORDS

behavioural problems, gender, parenting problems, PTSD symptoms, secure residential youth care, trauma

1 | INTRODUCTION

Secure residential youth care (SRC) provides assistance to adolescents who exhibit serious behavioural 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 behavioural problems (De Swart

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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 behavioural problems, 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). Because 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 programmes (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), aetiological factors of behavioural problems (DeMatteo & Marczyk, 2005; MacGuire, 1999). In the present study, behavioural problems are defined as internalizing behavioural problems (i.e. withdrawn and anxiously depressed behaviour) and as externalizing behavioural problems (i.e. rule-breaking and aggressive behaviour) (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. behavioural problems, post-traumatic stress disorder [PTSD], low perceived competence, problems in the parent–child relationship and 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 are 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 that 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 behavioural problems, adolescent symptoms of 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 behavioural 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 programmes 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 programmes 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, because existing research does not sufficiently clarify the extent to which the prevalence of behavioural problems and the presence of risk factors actually differ between boys and girls. It is clear neither whether these factors are related to the behavioural 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 behavioural problems and risk factors. Findings have shown that girls in residential care tend to show higher rates of internalizing behavioural problems 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 behavioural problems compared to boys.

In residential youth care programmes, 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 programmes 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 behavioural problems, the most frequently mentioned difference between boys and girls in residential youth care programmes 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

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sensitivity in developing behavioural 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 behavioural problems (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 behavioural problems of adolescents in SRC is scarce. Nevertheless, from the general population, we know that parental warmth and child-management skills are protective factors for the development of externalizing behavioural 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 behaviour.

1.1 | Present study

Adolescents are most often referred to SRC because of their behavioural problems. In accordance, behavioural problems 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 behavioural problems. Given that SRC is provided in order to treat behavioural 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 behavioural problems 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 as follows: (i) To what extent do individual risk factors, familial risk factors and externalizing and internalizing behavioural problems occur in boys and girls in SRC? (ii) Are there differences between boys and girls with regard to the seriousness of these risk factors and externalizing and internalizing behavioural problems? (iii) To what extent are these risk factors associated with externalizing and internalizing behavioural problems? (iv) Are associations between PTSD symptoms and behavioural problems and associations between the parent–child relationship and behavioural problems 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 behavioural problems occur frequently (i.e. in more than half of the adolescents) within the sample. Second, internalizing behavioural problems and psychological PTSD symptoms are expected to be more severe among girls, in line with findings by Jozefiak et al. (2016) and Nijhof et al. (2018), and externalizing behavioural problems 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 behavioural problems, because 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 behavioural 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 behavioural problems for girls than for boys (Svensson, 2004).

2 | METHODS

First, approval of the research plan was received by the medical ethical review committee (TWOR [Review Committee Scientific Research Rotterdam] – Maasstad Hospital – 2018-24). Second, 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: (i) the adolescent stayed in care for at least 6 weeks, (ii) mastered the Dutch or English language and (iii) 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 and 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 2 weeks after admission. For this study, ratings of the behavioural problems of both the parents and the adolescents themselves were used, as their ratings are not interchangeable and yield 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).

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2.1 | Participants

Every adolescent and his or her family, admitted to two SRC settings in the Netherlands in the period September 2016 to July 2019, were asked to participate in the study ($N = 318$). Sixty-three adolescents (19.8%) who left the institution within 6 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 were 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, and 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 (for an overview of the sample, see Appendix A, Table A1). 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 ($\chi^2(1, N = 255) = 6.79$, $P < 0.01$). The average age of participants did not differ ($M = 15.58$ years, $SD = 1.38$) from that of non-participants ($M = 15.76$ years, $SD = 1.36$) ($t(253) = 0.29$, $P = 0.51$).

2.2 | 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-hour facilities is reducing behavioural 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 behavioural 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 6 weeks after the adolescents have been admitted to the institution, an individual treatment plan is established, under supervision of a behavioural 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 behavioural therapy and dialectic behavioural 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 (Youth Initiated Mentor [YIM]; Damen et al., 2017). Furthermore, a family counsellor is appointed when problems were identified in the family context (e.g. insufficient parenting skills, high parenting stress and a problematic parent–child relationship). The treatment is based on several approaches: a solution-oriented approach, a system-oriented approach, a cognitive behavioural 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, attention deficit hyperactivity disorder (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. Because not all adolescents return home after treatment in SRC, other adolescents are prepared for a suitable treatment trajectory after their stay in SRC.

2.3 | Variables and instruments

2.3.1 | Child Behavior Checklist 6–18 (CBCL)

To assess internalizing and externalizing behavioural 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 3-point Likert scale (0 = *not true*, 1 = *sometimes true* and 2 = *very true*) (e.g. 'My child argues a lot'). Scores between the 93rd and 97th percentiles 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 $\alpha = 0.90$ and $\alpha = 0.94$, respectively.

2.3.2 | 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

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themselves. The answering format is similar to that of the CBCL: a 3-point Likert scale (0 = *not true*, 1 = *sometimes true* and 2 = *very true*). The subscales ‘internalizing behavioural problems’ (six items) and ‘externalizing behavioural problems’ (six 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 $\alpha = 0.94$.

2.3.3 | Children's Revised Impact of Event Scale (CRIES-13)

The CRIES-13 is a self-report instrument to screen for psychological symptoms of PTSD (Olff, 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 7 days (e.g. ‘Do other things make you think about the event?’). The answers are given on a 4-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 Anxiety Disorders Interview Schedule for Children (ADIS-C) (*auc* = 0.91, 95% confidence interval [CI] 0.88–0.94). A cut-off score of ≥30 was found to offer the best balance between sensitivity (0.88) and specificity (0.76) (Verlinden et al., 2014), indicating an increased risk on PTSD (Verlinden & Lindauer, 2015). In the present sample, an internal consistency of $\alpha = 0.91$ was found.

2.3.4 | 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 5-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 $\alpha = 0.80$ in the present sample.

2.3.5 | 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’ (six items) and ‘parenting problems’ (seven 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 $\alpha = 0.91$, for the subscale parenting problems $\alpha = 0.85$ and for the total OBVL $\alpha = 0.92$.

2.3.6 | 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 5-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 $\alpha = 0.97$ was found for the subscale adaptive strategies and $\alpha = 0.91$ for the subscale maladaptive strategies in the present study.

2.4 | 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 behavioural problems were examined by means of bivariate correlation analyses (Appendix B, Table B1). To explore whether boys and girls differed on average scores for behavioural 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 behavioural problems (Aim 3), the hypothesized model was tested through structural equation modelling (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 because multiple outcome measures were included (i.e. internalizing behavioural problems reported by the adolescents and by their parents and externalizing behavioural problems 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

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account for incomplete data, as recommended by Wothke (1998). SEM was also used to test for the hypothesized moderating effects of gender on the link between psychological PTSD symptoms and behavioural problems (Aim 4a) and on the link between parent–child relationship and behavioural 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 because previous research indicated that the link between these risk factors and behavioural problems could be different for boys and girls.

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

3 | RESULTS

3.1 | Presence of behavioural problems in boys and girls

Regarding the first aim of the study, behavioural 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 behavioural problems was found in 64.9% of the adolescents. Symptoms of PTSD 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; 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.

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

As can be seen in Table 2, the independent-sample *t* tests indicated that girls showed more severe internalizing behavioural problems than boys did, according to their self-reports ($t(230) = 3.83$; $P < 0.001$). Girls also reported more severe PTSD symptoms ($t(217) = 5.26$; $P < 0.001$), lower perceived competence ($t(212) = -5.13$; $P < 0.001$) and more maladaptive emotion regulation ($t(198) = 3.19$; $P < 0.01$) than boys did.

Based on parent reports, boys suffer from more severe externalizing behavioural problems ($t(168) = -2.64$; $P < 0.01$) and problems in the parent–child relationship ($t(160) = -3.59$; $P < 0.001$) than girls do. Finally, parents of boys reported to experience more problems in their parenting ($t(161) = -3.22$; $P < 0.01$) than parents of girls did.

3.2 | The association of possible risk factors and behavioural problems

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 behavioural 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).

The model explained 11.3% of the variance in parent-reported internalizing behavioural problems ($R^2 = 0.113$; $P = 0.04$) and 28.3%

TABLE 1 Percentages of adolescents with behavioural problems in clinical range at admission (parent report and adolescent report)

	Boys			Girls		
	Total *N*	*N* problematic	%	Total *N*	*N* problematic	%
Behavioural problems						
Internalizing behavioural problems[a]	78	54	69.2	91	70	76.9
Externalizing behavioural problems[a]	78	70	89.7	91	69	75.8
Family context						
Problems in the parent–child relationship[a]	75	38	50.7	87	24	27.6
Parenting problems[a]	75	34	45.3	87	27	30.7
Individual problems						
PTSD symptoms[b]	99	20	20.2	120	58	48.3
Insufficient adaptive emotion regulation[b]	89	20	22.4	111	33	29.7
Maladaptive emotion regulation[b]	89	9	10.1	111	22	19.8
Impaired perceived competence[b]	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.
Abbreviation: PTSD, post-traumatic stress disorder.
[a]Parent report.
[b]Adolescent report.

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TABLE 2 Gender differences in behavioural problems and risk factors

	Boys			Girls			
	N	*M*	*SD*	*N*	*M*	*SD*	Test
Behavioural problems							
Internalizing behavioural problems[a]	78	16.39	9.2	92	18.57	10.30	$t(168) = 1.45^{ns}$
Externalizing behavioural problems[a]	**78**	**32.12**	**12.70**	**92**	**26.70**	**13.86**	$t(168) = -2.64^{**}$
Internalizing behavioural problems[b]	**105**	**2.34**	**2.72**	**127**	**3.80**	**2.99**	$t(230) = 3.83^{***}$
Externalizing behavioural problems[b]	105	3.55	2.51	127	3.92	2.42	$t(230) = 1.14^{ns}$
Family context							
Problems in the parent–child relationship[a]	**75**	**13.79**	**4.69**	**87**	**11.24**	**4.33**	$t(160) = -3.59^{***}$
Parenting problems[a]	**75**	**18.40**	**4.41**	**88**	**16.15**	**4.48**	$t(161) = -3.22^{**}$
Individual problems							
PTSD symptoms[b]	**99**	**17.38**	**13.23**	**120**	**28.63**	**17.58**	$t(217) = 5.26^{***}$
Insufficient adaptive emotion regulation[b]	89	128.21	34.61	111	122.87	35.09	$t(198) = -1.08^{ns}$
Maladaptive emotion regulation[b]	**89**	**69.00**	**18.92**	**111**	**78.37**	**21.96**	$t(198) = 3.19^{**}$
Impaired perceived competence[b]	**98**	**30.14**	**6.56**	**116**	**25.66**	**6.19**	$t(212) = -5.13^{***}$

Note: Significant differences are presented in bold.
Abbreviations: ns, not significant; PTSD, post-traumatic stress disorder.
[a]Parent report.
[b]Adolescent report.
$^{*}P < 0.05$. $^{**}P < 0.01$. $^{***}P < 0.001$.

of the variance in parent-reported externalizing behavioural problems ($R^2 = 0.283$; $P < 0.01$), respectively. The explained variance by the model on adolescent-reported scores on internalizing behavioural problems was 41.9% ($R^2 = 0.419$; $P < 0.01$) and 27.3% on externalizing behavioural problems ($R^2 = 0.273$; $P < 0.01$). As can be seen in Figure 1, higher scores on adolescent-reported maladaptive emotion regulation were related to more externalizing (adolescent report, $b(SE) = 0.04(0.01)$, $\beta = 0.32$, $P < 0.01$; parent report, $b(SE) = -0.19(0.06)$, $\beta = 0.30$, $P < 0.01$) and more internalizing behavioural problems (adolescent report, $b(SE) = 0.04(0.01)$, $\beta = 0.29$, $P < 0.01$; parent report, $b(SE) = 0.04(0.01)$, $\beta = 0.22$, $P = 0.03$). Furthermore, self-reported impaired perceived competence was significantly related to both internalizing ($b(SE) = -0.07(0.03)$, $\beta = -0.17$, $P = 0.03$) and externalizing behavioural problems ($b(SE) = -0.07(0.03)$, $\beta = -0.21$, $P = 0.02$), when reported by adolescents. In addition, adolescent-reported PTSD symptoms were positively and significantly related to adolescent internalizing behavioural problems ($b(SE) = 0.07(0.01)$, $\beta = 0.36$, $P < 0.01$).

Regarding associations with family factors, the parental experience of their parenting problems was significantly related to externalizing behavioural problems (parent report) ($b(SE) = 1.07(0.32)$, $\beta = 0.37$, $P < 0.01$).

3.3 | Interaction effects of gender

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

4 | DISCUSSION

The findings of this study reveal that several well-known risk factors for behavioural problems (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 behavioural problems 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 behavioural problems are present in adolescents admitted to SRC in the Netherlands. In most cases, these adolescents are referred to SRC because of severe behavioural problems (Eltink et al., 2017). It therefore comes as no surprise that 70% to 90% of the adolescents in this study exhibited behavioural problems within the clinical range at admission. However, according to parent reports, 22.2% of the adolescents displayed no behavioural 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, honour killing or abuse). Van Dam et al. (2010) found 99% of adolescents to exhibit

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FIGURE 1 Research model with the relations between risk factors and externalizing and internalizing behavioural problems reported by parents and youth. *P < 0.05. **P < 0.01. ***P < 0.001. [+]Only the estimates of significant associations are presented.

externalizing behavioural problems when admitted to Dutch SRC and 89% of adolescents to show internalizing behavioural problems. Internationally, the broader term 'residential care' is often used, which complicates comparisons with secure residential care. Nevertheless, based on the literature, adolescents admitted to residential care show externalizing behavioural 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 behaviour disorder or substance disorder) in 64% of the cases. Furthermore, internalizing behavioural problems 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 at least a part of the adolescents referred to residential care facilities to display no behavioural 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. Because 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 from 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 reported. However, Van Dam et al. (2010) found 58% of adolescents in SRC to have experienced one or more traumatic events (e.g. passing away of a parent, sexual abuse or child abuse). In residential youth care, Martin et al. (2017) found 46% of adolescents to have experienced child abuse. However, not every traumatic event leads to PTSD symptoms. A study by Collin-Vézina et al. (2011) showed the more traumatizing events an adolescent experience, the more likely the display of post-traumatic stress becomes. Post-traumatic stress results in an increased risk of difficulties in social functioning (Ellis et al., 2012; Lord et al., 2021). The

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information at admission was collected within 2 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 behavioural 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 behavioural problems would be present in at least half of the adolescents. This was confirmed for PTSD symptoms in girls and for behavioural 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 et al. (2015). Additional research on the presence of low perceived competence, and even on the much broader concept of low self-esteem, is unavailable. Because 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 behavioural problems 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 behavioural problems 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 behavioural 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 et al. (2004) explored differences in boys and girls in residential care. In their study, they found that girls showed higher levels of internalizing behavioural problems, as well as, in contrast to our findings, higher levels of externalizing behavioural problems than in boys. It has already been suggested back in 2004 that girls had a higher threshold with regard to their externalizing behaviour 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 behavioural problems 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 behavioural problems. 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 et al. (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 behavioural problems. A moderate association was expected between all risk factors and behavioural problems, 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 behavioural problems. In addition, perceived competence and maladaptive emotion regulation were found to be moderately associated with adolescent-reported externalizing behavioural problems and parenting problems. Furthermore, maladaptive emotion regulation and parenting problems were moderately related to parent-reported externalizing behavioural problems. Lastly, only maladaptive emotion regulation was found to be significantly related to parent-reported internalizing behavioural problems. 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 behavioural problems (Moltrecht et al., 2020; Wiggings et al., 2009). Baker et al. (2007) found, in their study of youth in residential treatment centres in the USA, sexual abuse to be associated with internalizing behavioural problems of girls and externalizing problems of boys. In the present study, PTSD symptoms were only associated with self-reported internalizing behavioural problems, for both boys and girls. There are several possible explanations for this difference: First, Baker et al. (2007) dichotomized the presence of behavioural problems, whereas we used a continuous measure, which can lead to different findings, because dichotomizing does not take into account the seriousness of the problems. Second, 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 et al. used file analysis.

Finally, the findings of the present study suggest that neither the relationship between PTSD symptoms and behavioural problems nor the relationship between problems in the parent–child relationships and behavioural 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 and coping strategies).

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4.1 | 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 behavioural problems, other factors, such as peer influence, cannot be ruled out, as they play an important role in predicting externalizing and internalizing behavioural 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.

4.2 | 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. Because the findings also indicate that PTSD symptoms, parenting problems, low perceived competence and maladaptive emotion regulation are related to behavioural 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 behavioural problems 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 programme for girls could concentrate on using eye movement desensitization and reprocessing (EMDR) (Rodenburg et al., 2009), trauma-focused cognitive behavioural therapy (Lenz & Hollenbaugh, 2015), narrative exposure therapy (NET) (Grech & Grech, 2020), youth empowerment programmes (YEPs) (Morton & Montgomery, 2013) or competitive memory training (COMET) (Korrelboom et al., 2011), because these interventions target those risk factors that are more prominent in girls. Moreover, emotion regulation can be improved through cognitive behavioural 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. Second, especially adolescents with a history of sexual abuse tend to engage in problematic sexualized behaviour, putting themselves and their peer at an increased risk of harm. Third, one should be aware that placement in SRC itself can be re-traumatizing (Zelechoski 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 although the residential sector is already working to increase the involvement of parents and social networks in treatment programmes (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) (Van der 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 behavioural problems, further research is necessary to widen the sector's knowledge about which adolescents benefit from treatment in SRC and which adolescents do not.

4.3 | Conclusion

Based on the results of this study, it can concluded that adolescents referred to SRC face a range of problems, at both the individual and familial levels, and that general treatment programmes 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 behavioural problems.

As for treatment interventions, there is no 'one size fits all' programme. 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 programmes and the additional effects of gender-specific interventions.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

ETHICS APPROVAL

After submitting the research proposal to the medical ethical review committee, we were exempt from the reviewing process (TWOR [Review Committee Scientific Research Rotterdam] – Maasstad Hospital – 2018-24).

DATA AVAILABILITY STATEMENT

The data generated and/or analysed during the current study are available from the corresponding author on reasonable request.

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How to cite this article: Gutterswijk, R. V., Kuiper, C. H. Z., van der Horst, F. C. P., Jongerling, J., Harder, A. T., & Prinzie, P. (2022). Behavioural problems of adolescents in secure residential youth care: Gender differences and risk factors. *Child & Family Social Work*, 1–15. https://doi.org/10.1111/cfs.12976

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APPENDIX A.

TABLE A1 Individual and family characteristics at admission in 115 boys and 140 girls

	Boys		Girls		Test
	M	*SD*	*M*	*SD*	
Age at admission (years)	15.59	1.44	15.58	1.35	$F(1, 253) = 0.67^{ns}$
	N	%	*N*	%	
Ethnic background					
Dutch background	70	60.9	86	61.4	$\chi^2(1, N = 156) = 0.01^{ns}$
Non-Western migration	36	31.3	43	30.7	$\chi^2(1, N = 79) = 0.01^{ns}$
Western migration	9	7.8	11	7.9	$\chi^2(1, N = 20) = 0.00^{ns}$
Daytime activities					
School/study	**69**	**61.1**	**102**	**76.1**	$\chi^2(1, N = 171) = 6.53^{*}$
None	**39**	**34.5**	**25**	**18.7**	$\chi^2(1, N = 64) = 8.03^{**}$
School/work	5	4.4	7	5.2	$\chi^2(1, N = 12) = 0.09^{ns}$
Previous living situation					
Residential youth care	37	32.7	44	33.6	$\chi^2(1, N = 81) = 0.02^{ns}$
Secure residential care	19	16.8	29	22.1	$\chi^2(1, N = 48) = 1.09^{ns}$
Single-parent family	23	20.4	22	16.8	$\chi^2(1, N = 45) = 0.51^{ns}$
Two-parent family	17	15.0	20	15.3	$\chi^2(1, N = 37) = 0.00^{ns}$
Foster care	3	2.7	5	3.8	$\chi^2(1, N = 8) = 0.26^{ns}$
Juvenile justice institution	**7**	**6.2**	**0**	**0.0**	$\chi^2(1, N = 7) = 8.36^{**}$
Family-style group care	1	0.9	1	0.8	$\chi^2(1, N = 2) = 0.01^{ns}$
Other	6	5.3	10	7.6	$\chi^2(1, N = 16) = 0.36^{ns}$
Future perspective					
Follow-up intervention	68	60.2	72	55.8	$\chi^2(1, N = 140) = 0.47^{ns}$
Back home	42	37.2	49	38.0	$\chi^2(1, N = 91) = 0.02^{ns}$
Living on their own	1	0.8	5	3.9	$\chi^2(1, N = 6) = 2.23^{ns}$
Long-term care	2	1.8	3	2.3	$\chi^2(1, N = 5) = 0.09^{ns}$

Note: Significant differences are presented in bold.
Abbreviation: ns, not significant.
$^{*}P < 0.05$. $^{**}P < 0.01$ (chi-squared test).

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APPENDIX B.

TABLE B1 Descriptives and intercorrelations of the variables for boys and girls

	Boys											
Girls	1	2	3	4	5	6	7	8	9	10	M	*SD*
1. PTSD symptoms	–	−0.26*	−0.13	0.43**	0.04	−0.03	0.05	0.20	0.31**	0.50**	17.38	13.23
2. Perceived competence	−0.38**	–	0.23*	−0.19	−0.01	−0.05	−0.07	−0.15	−0.36**	−0.24*	29.97	7.41
3. Adaptive emotion regulation	0.01	0.39**	–	0.22*	0.00	−0.12	0.03	−0.11	−0.15	0.02	128.21	34.61
4. Maladaptive emotion regulation	0.37**	−0.39**	0.12	–	0.08	0.08	0.32**	0.21	−0.42**	0.51**	69.00	18.92
5. Parent–child relationship	−0.14	−0.11	0.08	0.15	–	0.72**	0.38**	0.16	0.11	0.23*	13.79	4.69
6. Parenting problems	−0.06	−0.16	−0.12	0.12	0.63**	–	0.43**	0.24*	0.09	0.11	18.40	4.41
7. Externalizing behavioural problems (parent report)	0.07	−0.10	−0.04	0.21	0.42**	0.54**	–	0.50**	0.33**	0.04	32.12	12.70
8. Internalizing behavioural problems (parent report)	0.19	−0.05	0.00	0.24*	0.13	0.19	0.43**	–	0.38**	0.13	16.38	9.18
9. Externalizing behavioural problems (adolescent report)	0.37**	−0.23*	−0.11	0.36**	0.19	0.14	0.13	−0.08	–	0.20*	3.53	2.71
10. Internalizing behavioural problems (adolescent report)	0.49**	−0.38**	0.06	0.53**	0.03	0.01	0.08	0.23*	0.11	–	2.31	2.71
M	28.63	25.66	122.87	78.37	11.24	16.15	27.54	18.88	3.96	3.81		
SD	17.58	6.19	35.09	21.96	4.33	4.48	13.56	10.01	2.41	3.00		

Abbreviation: PTSD, post-traumatic stress disorder.
*$P < 0.05$. **$P < 0.01$.

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