

**The predictors of treatment outcome of cognitive
behavior group therapy (STEPS) for adolescent girls
after a single rape experience**



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Preface

In september 2010 ben ik begonnen aan de Master Klinische en Gezondheidspsychologie aan de Universiteit Utrecht. Ik kreeg de mogelijkheid om mijn Master thesis te schrijven bij het Landelijk Psychotraumacentrum in het Wilhelmina Kinderziekenhuis te Utrecht. Met veel enthousiasme heb ik hier samen met Maike Smeets de afgelopen maanden aan gewerkt.

Er zijn een aantal mensen die ik graag wil bedanken voor hun hulp en steun tijdens het schrijven van deze thesis. Allereerst wil ik Iva Bicanic, wetenschappelijk onderzoeker en GZ- psycholoog van het Psychotraumacentrum, bedanken. Zij heeft ons altijd intensief en met veel enthousiasme begeleid. Haar goede tips en haar waardevolle feedback hebben positief bijgedragen aan dit eindresultaat. Daarnaast wil ik haar bedanken voor de mogelijkheid om mee te lopen met ‘The International Conference on Survivors of Rape’ in oktober 2010. Ook gaat mijn dank uit naar mijn scriptiebegeleider Rolf Kleber, hoogleraar aan de Universiteit Utrecht. Zijn kritische blik en brede kennis over psychotrauma heeft ons tot nieuwe inzichten gebracht. Ik wil Floryt van Wesel, wetenschappelijk onderzoeker bij de afdeling Methoden en Technieken, bedanken voor haar hulp. We konden altijd bij haar terecht met vragen over de analyses. Tot slot wil ik natuurlijk Maike bedanken voor de goede en vooral gezellige samenwerking.

Ik hoop dat u met veel interesse deze Master thesis zal lezen.

Fleur Botman

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Abstract

Objective: The purpose of this study was to investigate the predictors of treatment outcome of cognitive behavior group therapy (STEPS) for adolescent girls after a single rape experience.

Methods: Sixty-two girls between the age of 13 and 18 participated in the STEPS treatment. One girl dropped out. Several self-report questionnaires (TSCC, CRTI, YSR/11-18) were filled out at pre- and post-treatment to determine the level of trauma-related symptoms. The efficacy of STEPS was investigated using a paired samples t-test. The possible predictors (Baseline score, perpetrator, physical violence, threat with a weapon and report to the police) were analysed using a hierarchical regression analysis.

Results: A significant reduction of trauma-related symptoms was found from pre-treatment to post-treatment, with one exception (CBCL-YSR Externalizing). A higher baseline score predicted a relatively higher post-treatment score for the depression, anxiety and posttraumatic stress symptoms, as well as the internalizing and externalizing problems and the total of emotional and behavioral problems. The experience of physical violence during the trauma predicted a better treatment outcome for anxiety symptoms and being threaten with a weapon predicted a less successful treatment outcome for depression and posttraumatic stress symptoms. A known or unknown perpetrator did not predict treatment outcome even as reporting the case to the police.

Conclusion: There is a significant mean reduction of trauma-related symptoms after the STEPS treatment. Therefore individual girls should not be excluded from this treatment based on the outcome predictors found in this study. It is advised to monitor the girls at risk during treatment.

Samenvatting

Doelstelling: Het doel van deze studie was het onderzoeken van de voorspellers van de therapie-uitkomst van de cognitieve gedragstherapie (STEPS) voor adolescente meisjes als gevolg van eenmalig seksueel geweld.

Methoden: 62 meisjes tussen 13 en 18 jaar oud hebben de STEPS behandeling gevolgd. Een meisje is voortijdig gestopt. Voor en na de behandeling werden verschillende zelfrapportage vragenlijsten afgenomen (TSCC, SVLK, YSR/11-18) om het niveau van traumagerelateerde symptomen vast te stellen. De effectiviteit van STEPS werd onderzocht aan de hand van een afhankelijke t-toets. De mogelijke voorspellers (voormeting, dader, fysiek geweld, dreiging met een wapen en aangifte doen) werden geanalyseerd door middel van een hiërarchische multi-pele regressie analyse.

Resultaten: Er werd een significante vermindering van de traumagerelateerde symptomen gevonden, met uitzondering van YSR Externaliserende problemen. Een hoge voormeting voorspelde een relatief hogere nameting voor depressie, angst en posttraumatische stress symptomen. Daarnaast voorspelde een hoge voormeting een relatief hogere nameting op internaliserende en externaliserende problemen en het totaal aan emotionele en gedragsproblemen. Het meemaken van fysiek geweld tijdens het trauma voorspelde een betere therapie-uitkomst voor angst symptomen. Bedreigd worden met een wapen voorspelde een minder goede therapie-uitkomst voor depressie en posttraumatische stress symptomen. Een bekende of onbekende dader of aangifte doen bij de politie bleken geen voorspellers te zijn.

Conclusie: Een significante gemiddelde afname is gevonden voor traumagerelateerde symptomen na de STEPS therapie. Op basis van de gevonden voorspellers mogen individuele meisjes daarom niet uitgesloten worden van deze behandeling. Het wordt geadviseerd om de meisjes die risico lopen te begeleiden tijdens de behandeling.

Introduction

Rates of rape across the world are disturbingly high. In the United States, life-time prevalence of rape in women is estimated around 18% (Tjaden & Thoennes, 2006). In the Netherlands, this number is approximately 12%. Of this group, young women between the age of 15-25 years are affected the most (7%) (Bakker et al., 2009). These numbers are possibly underestimates given the high underreporting of sexual assault (Kaufman, 2009). Reasons for not disclosing the assault can be feelings of shame, fear, embarrassment and anticipation of negative reactions of others (Kearns, Edwards, Calhoun & Gidycz, 2010; Ullman, 2007).

Consequences of rape

Rape can have serious long-term psychological and physical consequences (Danielson & Holmes, 2004; Zoellner, Goodwin & Foa, 2000). Victims are at high risk of developing Post Traumatic Stress Disorder (PTSD) (DSM-IV-TR; American Psychiatric Association, 2000; Danielson & Holmes, 2004). The clinical features of PTSD are re-experiencing the trauma, a pattern of avoidance and emotional numbing and symptoms of arousal (Sadock & Sadock, 2007; Yehuda, 2002). Re-experiencing the trauma may include intrusive recollections of the trauma, having disturbing dreams and experiencing intense distress at exposure to cues that symbolize the event. Possible avoidance symptoms are keeping off thoughts and feelings about the trauma and avoiding activities, places or people associated with the trauma. The inability to recall important aspects of the trauma, diminished interest in formerly enjoyable activities and feelings of detachment may also occur. Symptoms of arousal are difficulty falling or staying asleep, irritability or outbursts of anger, difficulty concentrating or hyper vigilance for danger. The disturbance should be at least one month and cause clinically significant distress or impairment in social, occupational or other important areas of functioning in order to diagnose PTSD (Yehuda, 2002). The levels of PTSD appear to be higher and more severe in victims of rape than in victims of a non-sexual assault (Kessler, 2000). Up to fifty percent of rape victims may suffer from PTSD three months after the event (Elklit & Christiansen, 2010; Rothbaum, Foa, Riggs, Murdock & Walsh, 1992). Comorbid

problems include depression, anxiety, suicide attempts, substance abuse and eating disorders (Cohen & Mannarino, 1996; Danielson & Holmes, 2004; Wolitzky-Taylor et al., 2008). An additional consequence is a higher risk of sexual revictimization (Danielson & Holmes, 2004; Risser, Hetzel-Riggin, Thomsen & McCanne, 2006).

Individuals with PTSD exhibit more negative health symptoms than individuals without PTSD. Possible physical consequences of rape include elevated rates of headaches, stomach aches, back pain, cardiac arrhythmia and menstrual symptoms (Zoellner et al., 2000).

Treatment of rape victims

The studies above emphasize the need for effective treatment after rape. A recent review of treatments for adult rape victims showed that several types of Cognitive Behavioral Therapy (CBT) such as Cognitive Processing Therapy, Prolonged Exposure, Stress Inoculation Training as well as Eye Movement Desensitization and Reprocessing (EMDR), are effective for reducing PTSD symptoms (Vickerman & Margolin, 2009). The underlying component of these treatments is exposure, which consists of a confrontation with the feared objects, situations, memories and images by either imaginal exposure or exposure in vivo. The goal of exposure therapy is to help the victim emotionally process the trauma (Yehuda, 2002). The effectiveness of trauma-focused CBT for sexually traumatized children and adolescents is also demonstrated (Cohen, Mannarino & Berliner, Deblinger, 2000). Treatment guidelines recommend CBT as the first-line treatment for childhood PTSD (American Academy of Child and Adolescent Psychiatry, 2010).

The development of evidence based treatments has prompted the question what factors predict a positive treatment outcome, since not all patients benefit from treatment. One-fifth to one-half of sexual assault victims may still meet PTSD criteria after therapy (van Minnen, Arntz & Keijsers, 2002; Vickerman & Margolin, 2009). Establishing the predictors of treatment outcome is important because this makes it possible to identify those who may or may not benefit from treatment. Different or modified treatments can be provided to those with poorer treatment outcomes (Rizvi, Vogt & Resick, 2009). The predictors may also provide more insight into the therapy (van Minnen et al., 2002).

Previous studies of predictors of treatment outcome

Several studies examined predictors of treatment outcome in sexually traumatized children and adults. In children, evidence was found for parental emotional distress and parental support (Cohen & Mannarino, 1996; 1998; 1999), being predictors of a respectively less and more positive treatment response. In adults, physical injury during the assault (Hembree, Street, Riggs & Foa, 2004), higher base-line PTSD symptomatology (Karatzias et al., 2007; van Minnen et al., 2002), suicide risk (Tarrier, Sommerfield, Pilgrim & Faragher, 2000) and experience of trauma in childhood (Karatzias et al., 2007; Tarrier, 2000), were found to predict less positive treatment outcome, whereas social support turned out to positively influence treatment response (Thrasher, Power, Morant, Marks & Dalgleish, 2010). No evidence was found for depression being a predictor for treatment response (Karatzias et al., 2007; van Minnen et al., 2002; Tarrier et al., 2000; Thrasher et al., 2010), although one study concluded the opposite (Rizvi et al., 2009).

Although the predictors of treatment outcome in sexually traumatized children and adults have been studied, no research on this topic is conducted on adolescents. Since puberty is a time when adolescents experiment with the boundaries of sexuality and intimacy, adolescent girls are four times more likely to be sexually assaulted than women in all other age groups (Kaufman, 2009; Rickert, Vaughan & Wiemann, 2002). Therefore, it is important to focus attention on this age-group.

Present study

The purpose of the present study was to answer the question: *What are the predictors of treatment outcome of cognitive behavior group therapy (STEPS) for adolescent girls after a single rape experience?* In this study, rape is defined as a single event that involves the use or threat of force to penetrate the victim's vagina or anus by penis, tongue, fingers or object, or the victim's mouth by penis (Tjaden & Thoennes, 2006). This definition includes both attempted and completed rape. STEPS is a trauma-specific CBT developed in the Psychotrauma Center for Children and Youth at the University Medical Center (UMC) in Utrecht. The aim of this therapy is to reduce rape-related PTSD symptomatology and normalize (avoidance) behavior in adolescent girls

who have experienced a single rape. Recently, an evaluation of STEPS has been performed, showing that girls report clinically and statistically significant lower levels of trauma-related symptoms after STEPS, until 12-month follow-up (Bicanic, de Roos, van Wesel, Sinnema, van de Putte, submitted).

The predictors of treatment outcome in adolescents have not been investigated yet. In this study, one possible predictor could be based on previous research of predictors of treatment outcome, namely;

1) Baseline score. Lower baseline PTSD was associated with better treatment outcome on the PTSD scale (Karatzias et al., 2007). Corresponding with this result, victims who showed more PTSD-symptoms at pre-treatment, showed more PTSD-symptoms at post-treatment and follow-up (van Minnen et al., 2002). In this study, the baseline scores on the PTSD measures are taken into account, as well as the baseline scores of the other measures used.

Based on clinical experiences, some trauma related characteristics were hypothesized to influence treatment outcome. Since these variables have not yet been investigated, the analyses are considered exploratory. The following possible predictors are selected;

2) Known or unknown perpetrator. About half of the rapes are committed by strangers (Sadock & Sadock, 2007). Several studies compared the impact of a known to an unknown perpetrator and found no difference in psychological symptomatology (Davidsson, Benjaminsson, Wijma & Swahnberg, 2009; Frank, Turner & Stewart, 1980). Koss and colleagues concluded the same but did find that stranger rapes led to victims reporting more fear compared to rapes committed by known perpetrators (Koss, Dinero & Seibel, 1988).

3) Experiencing physical violence during the trauma. Although rape does not often occur in combination with physical violence (Tjaden & Thoennes, 2000), the experience of physical injury during the trauma is negatively associated with the outcome on CBT (Hembree et al., 2004).

4) Being threatened with a weapon. A weapon is used in 30 percent of the rape cases (Allison & Wrightsman, 1993). Victims who perceived that their lives were in danger at the time of the trauma, reported more PTSD symptom severity (Ullmann & Filipas,

2001). Also, the perception of life threat during the trauma predicted less recovery (Hembree et al., 2004).

5)Reporting the case to the police. Current literature suggests that only a minority of the victims reported their case to the police. In the United States, this is found to be 15%. The police and the legal system do not always support victims in a proper way. Rape victims who had reported abuse to the police suffered from poorer self-reported health than those who had not done so (Davidsson et al., 2009). The help itself was perceived as stressful and traumatic by some victims (Campbell et al., 1999).

Based on the information above I hypothesize the following;

- 1) Higher baseline score predicts a less positive treatment outcome.
- 2) Being raped by an unknown perpetrator predicts a less positive treatment outcome.
- 3) Experiencing physical violence during the trauma predicts a less positive treatment outcome.
- 4) Being threatened with a weapon during the trauma predicts a less positive treatment outcome.
- 5) Reporting the case to the police predicts a less positive treatment outcome.

Methods

Participants

Eligibility Criteria

Between 2005 and 2009, 193 girls were referred to the Psychotrauma Center of the UMC Utrecht and the Psychotrauma Center of the GGZ Rivierduinen in Leiden.

Of the 193 girls, 62 adolescent girls (32%) did participate in STEPS group therapy. The other girls did not meet the criteria for inclusion.

Inclusion criteria for the therapy are: girls between the age of 13-18; experience of a single rape or assault; PTSD as a result of the trauma; stable living situation; ability to talk about the trauma; participation of the parents and being able to make agreements about suicide behavior, self-mutilation, prostitution, promiscuous behavior or the attendance in the group. One girl (1.6%) dropped out during treatment because of feeling unsafe in the group. The exclusion criteria are: PTSD not the primary diagnosis; history of chronic sexual trauma or physical abuse; unwillingness to participate in the girls' or parents' group; alcohol or drug addiction; psychotic disorder; IQ lower than 85; acute psychosis or schizophrenia; severe problems with aggression against others; real current threat; limiting health conditions or when the perpetrator is a family member.

Demographic characteristics

The mean age of the 62 participants is 16.0 years (SD = 1.4, range 12.6-18.9 yrs.). All girls live with one or both parents. 37.1% of the parents are divorced. The majority of the sample is Dutch (88.7%), with 11.3% representing other ethnicities. The educational level of the girls is divided in lower (61.3%), middle (21.0%) and higher (17.7%) level of education.

Trauma-related characteristics

In this sample 87.1% of the girls experienced rape, the other girls experienced an assault (12.9%). The mean time between the experience and the moment of disclosure was 25.7 weeks (SD = 49.2, range 1-236 weeks). The majority of the girls first disclosed the trauma to their friends (51.6%), parents (17.7%) or boyfriends (12.9%). The time

between the trauma and reporting to the Psychotrauma Center ranged from 1 to 260 weeks, with a mean time of 53.8 weeks (SD = 62.3).

Almost three-quarter of the girls (72.5%), knew the perpetrator. For the remaining girls the perpetrator was unknown (27.4%). Of the girls, 82.3% were raped or assaulted by one perpetrator and the others by two or more (17.8%). In 54.8% of the cases the perpetrator was Dutch, in the other cases (45.2%) the perpetrator had another ethnicity. 38.7% of the girls experienced physical violence, 16.1% experienced a threat with a weapon and 51.6% experienced verbal threats. 35.5 % of the victims reported the case to the police.

Procedure

The Psychotrauma Center of the UMC Utrecht and the Psychotrauma Center of the GGZ Rivierduinen in Leiden treat adolescent girls who have experienced sexual violence. The girls were reported to the center by different authorities, varying from the police, the general practitioner, the parents, the school to other rescuers. After the telephone intake the girl and her parents were invited for an assessment interview. This entails a detailed trauma history, including information about the lifetime number and types of trauma experienced by the victim and an evaluation of trauma characteristics, known to be associated with increased PTSD. Also, a semi-structured clinical interview was conducted in girls to determine the presence of PTSD and potential other psychopathology (Anxiety Disorders Interview Schedule (ADIS-C) - Children's version, Silverman & Albano, 1996; Dutch version by Siebelink & Treffers, 2001). The ADIS-C is used since 2007, and was conducted in only 40 girls. For that reason this measure was not included in this study. To determine whether the girl experienced sexual trauma in the past, the Childhood Unwanted Sexual Events List-Adolescents (Lange, 2004) was used. The adolescent girls and parents filled out several self-report questionnaires. Based on the diagnostic results, it was decided whether the girls were eligible for STEPS. If not, individual STEPS, EMDR or other treatments were provided.

In the Psychotrauma Center UMC Utrecht, STEPS is developed for adolescent girls who have experienced a single rape and their parents (Bicanic, Kremers, Groot, Strijker en Vos, 2007a; 2007b; 2007c). STEPS is a trauma-specific CBT that can be

performed in a group with four girls or individually. The aim of this therapy is to reduce rape-related PTSD symptomatology and to normalize (avoidance) behavior. The therapy consists of eight, weekly sessions of two hours duration. There are five main components of the treatment; psycho-education, exposure to trauma narrative, cognitive restructuring, graded exposure in vivo and relapse prevention. Psycho-education focuses on the definition, facts and consequences of rape and provides sexual education. Exposure to trauma narrative consists of disclosure through writing and speaking. Cognitive restructuring is aimed at dysfunctional cognitions about intrusions, avoidance, sleeping problems, guilt and shame. Graded exposure in-vivo consists of establishing personal treatment goals in terms of reducing avoidance behavior. During relapse prevention, plans are composed to recognize relapse signals and how to act on these signals. Parallel to the group therapy is a 6 week parent support group.

Measures

The adolescent girls filled out the following self-report questionnaires before and directly after the STEPS treatment.

Trauma Symptom Checklist for Children (TSCC).

The TSCC (Briere, 1996) is a 54-item self-report instrument to measure the effect of childhood trauma for children age 8-16. It consists of two validity scales (Under-response and Hyper-response), six clinical scales (Anxiety, Depression, Posttraumatic Stress, Dissociation, Anger, and Sexual Concerns) and 8 critical items which examine situations that may require follow-up, such as suicidal thoughts. On a 4-point Likert-type scale (never, sometimes, lots of time, almost all the time), the adolescent indicates how often a thought, feeling or behavior occurs. Cut-off scores are provided to identify invalid profiles on the two invalidity scales as well as clinical scores on the symptom scales. The questionnaire has been frequently used in research on trauma among adolescents, which confirmed its good psychometric qualities (Nilsson, Wadsby & Svedin, 2008). Data on the TSCC suggest that internal reliability is adequate (Cronbach's Alpha ranging from .77 to .89), and convergent and discriminant validity indices are reported to be satisfactory (Briere, 1996).

Children's Responses to Trauma Inventory (CRTI).

To measure posttraumatic stress reactions, the Dutch adaptation of the Children's Responses to Trauma Inventory was used (CRTI; Alisic, Eland & Kleber, 2006). The questionnaire measures the PTSD symptoms according to the DSM-IV (American Psychiatric Association, DSM-IV-TR, 2000) and other relevant reactions often observed in children. The list consists of 34 items, divided into 4 subscales: Intrusion, Avoidance, Arousal and Other Child-Specific Reactions. There is a child version (age 8 to 18) and a parent version (for parents of children from 4 to 18 years old). Data on the CRTI suggest that internal reliability is good to excellent (Cronbach's Alpha ranging from .71 to .92), and convergent and discriminant validity are established (Alisic & Kleber, 2010). The CRTI has been revised in 2006. The revised version is not comparable to the old version and therefore this questionnaire is filled out by only 39 participants. This number does meet the minimum sample size of 30 that is needed to perform statistical analysis (Baarda & de Goede, 2006). It is decided to include this measure to get a more comprehensive measurement of PTSD since the Posttraumatic stress scale of the TSCC mainly contains intrusive symptoms (Eht, 2001). The CRTI measures the intrusive symptoms as well as the avoidance and arousal symptoms.

Youth Self-Report for ages 11-18 (YSR/11-18).

The YSR (Achenbach & Rescorla, 2001) is the adolescent (11 to 18 years) version of the Child Behaviour Checklist and evaluates the teenager's perception of emotional and behavior problems. The first part covers 11 competence items about the child's activities, social relations and school performance. The second part consists of 112 items and evaluates the frequency of the behavior in the last 6 months on a 3-point scale (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often true). The YSR scoring profile provides raw scores, T scores, and percentiles for three competence scales (Activities, Social, and School), Total Competence, eight cross-informant syndromes, and Internalizing, Externalizing and Total Problems. The cross-informant syndromes scored from the YSR/11-18 are Aggressive Behavior; Anxious/Depressed; Attention Problems; Rule-Breaking Behavior; Social Problems; Somatic Complaints; Thought Problems; and Withdrawn/Depressed. The Internalizing scale consists of the

subscales Anxious/Depressed, Withdrawn/Depressed and Somatic Complaints. The Externalizing scale contains the subscales Rule-Breaking Behavior and Aggressive Behavior. Total Problems are all the emotional and behavioral problems measured. A higher score reflects greater behavior problems. Data on the YSR/11-18 suggest that internal reliability is acceptable (Cronbach's Alpha ranging from .71 to .95), and convergent and discriminant validity are reported to be satisfactory (Achenbach, Howel, McConaughy & Stranger, 1995)

Treatment outcome measures

The following scales were used as outcome measures to measure PTSD: The Posttraumatic Stress subscale of the TSCC (Briere, 1996) as well as the subscales Intrusion, Avoidance and Arousal and the Total DSM score of the CRTI (Alisic, Eland & Kleber, 2006). The subscales Anxiety and Depression of the TSCC (Briere, 1996) and the subscales Internalizing problems, Externalizing problems and Total Problems of the YSR/11-18 (Achenbach & Rescorla, 2001) were also used to measure treatment outcome.

Possible predictors

In this study, five variables are used as possible predictors for treatment outcome; the baseline scores on the subscales of the CRTI, TSCC and YSR as described above, perpetrator (known or unknown), experiencing physical violence (being hit, bitten, strangled or kicked; yes or no), being threatened with a weapon (yes or no) and report to the police (yes or no).

Data Analysis

The statistical analyses were performed using SPSS version 16.0, 'Statistical Package for the Social Sciences'. First, a paired-samples *t*-test was conducted to assess the changes between pre- and post-treatment (Field, 2005; Rubin, 2010) and to establish a significant reduction in symptomatology. After that, for the prediction of treatment outcome, a hierarchical multiple regression analysis was performed on each outcome measure, with the predictor variables entered in two blocks. Using a two-stage model improves the accuracy of predictions (Rothman, Greenland & Lash, 2008). The post-

treatment scores on the outcome measures were entered as the dependent variables. Baseline score on the outcome measures was entered as independent variable in block one. This variable is based on previous research and was therefore entered first (Field, 2005). The following independent variables were entered in the second block: Perpetrator, physical violence, threat with a weapon and report to the police. Variables that show significance ($p < 0.05$) at post-treatment were considered as stable predictors. Marginally significant variables ($p < 0.10$) were also taken into account.

Results

Efficacy of treatment

Table 1 shows the mean scores on the outcome measures at pre-treatment and post-treatment. A paired-samples *t*-tests revealed that significant improvements were found from pre-treatment to post-treatment, with one exception (YSR Externalizing problems). Comparing the three subscales of the TSCC with the normative data, based on three non-clinical samples of 3008 children, showed that at pre-treatment the mean scores were in the borderline range ($T = 50-65$) (Briere, 1996). At post-treatment, the mean scores of the Depression and Anxiety scales decreased and fell within the normal range. The mean score on the Posttraumatic Stress scale was on the cut-off between normal and borderline after the treatment. At pre-treatment, the mean scores of the subscales of the CRTI were higher than the available mean scores of the normative data of girls between the age of 13 to 18 (DSM total: 54.41; Intrusion: 15.78; Avoidance: 22.84; Arousal: 16.22). After treatment, the mean scores were lower than the mean scores of the normative data. The normative data of the YSR are based on a sample of 1,057 youth (Bérubé & Achenbach, 2001). Comparing these data with the mean scores demonstrated that the mean score of the Internalizing problems subscale was within the clinical range ($T > 63$) and the mean score of Total problems was within the borderline range ($T = 60-63$). Both pre- and post-treatment scores of the Externalizing subscale were in the normal range (Achenbach & Rescorla, 2001). After treatment the mean scores of all subscales fell within the normal range.

Table 1
Mean (SD) and effect size on outcome measures at pre-treatment and post-treatment

	<i>Pre-treatment</i>		<i>Post-treatment</i>		Cohen's <i>d</i>
	<i>N</i>	Mean (SD)	<i>N</i>	Mean (SD)	
TSCC					
Depression	61	52.87 (8.93)	61	47.43 (8.12)***	.64
Anxiety	61	55.00 (8.53)	61	49.64 (7.78)***	.66
Posttraumatic stress	61	58.77 (6.97)	61	50.07 (7.74)***	1.18
CRTI					
Total DSM	39	59.10 (9.64)	39	42.56 (14.66)***	1.33
Intrusion	39	17.62 (3.82)	39	11.87 (5.15)***	1.27
Avoidance	39	24.26 (4.20)	39	17.38 (5.72)***	1.37
Arousal	39	17.54 (4.33)	39	13.56 (4.96)***	.85

Table 1 continued

YSR/11-18					
Internalizing	59	63.54 (8.53)	59	56.14 (10.34)***	.78
Externalizing	59	55.34 (7.98)	59	53.54 (8.80)*	.21
Total	59	60.49 (6.90)	59	54.75 (9.10)***	.71

Cohen's *d* (Cohen, 1988). TSCC (t-scores subscales range: depression 37-85; anxiety 35-92; posttraumatic stress 35-82; higher scores indicating more psychopathology); CRTI (subscales range: total DSM 17-85; intrusion 5-25; avoidance 7-35; arousal 5-25; higher scores indicating more posttraumatic stress reactions); YSR/11-18 (t-scores subscales range: internalizing 50-100; externalizing 50-100; total 50-100; higher score indicating more emotional and behavioral problems).

* $p < .10$, ** $p < .05$, *** $p < .001$.

Predictors of treatment outcome

Trauma Symptom Checklist for Children

Table 2 presents the results of the hierarchical multiple regression analysis for the predictors of treatment outcome on the TSCC subscales Depression, Anxiety and Posttraumatic Stress. Baseline depression score accounted for 23% of the variance in post-treatment score of depression, $F(1,59) = 17.53, p < .001$. In step 2, perpetrator, physical violence, threat with a weapon and report to the police added significantly to the model, accounting for an additional 11% of the variance, $F(5,55) = 5.70, p < .001$. The regression analysis revealed that the baseline score of the Depression subscale was a significant predictor of treatment outcome, with a higher depression score at baseline predicting a relatively higher score at post-treatment. One characteristic of the trauma is related to treatment outcome. The experience of a threat with a weapon significantly predicted treatment outcome, with relatively more depression symptoms at post-treatment.

Baseline anxiety score accounted for 17% of the variance in post-treatment score of anxiety, $F(1,59) = 11.76, p < .05$. Step 2 added significantly to the model, accounting for an additional 15% of the variance, $F(5,55) = 5.04, p < .05$. A higher baseline anxiety score predicted relatively higher scores after treatment. Physical violence was a significant predictor of treatment outcome on the Anxiety subscale, with experiencing physical violence during the assault predicting relatively lower levels of anxiety symptoms after treatment.

Baseline posttraumatic stress score accounted for 9% of the variance in post-treatment score of posttraumatic stress, $F(1,59) = 5.45, p < .05$. Step 2 added significantly to the model, accounting for an additional 10% of the variance, $F(5,55) =$

2.52, $p < .05$. A higher baseline posttraumatic stress score predicted relatively higher scores after treatment. The experience of a threat with a weapon significantly predicted treatment outcome, with relatively more posttraumatic stress symptoms at post-treatment.

Table 2
Results of the hierarchical multiple regression analysis. Dependent variable: post-treatment score of the TSCC subscales. $N= 61$

			B	SE B	β
TSCC Depression	Step 1	Constant	24.43	5.57	
		Baseline score	0.44	0.10	.48***
		R^2	.23***		
	Step 2	Constant	30.15	6.40	
		Baseline score	0.34	0.11	.38**
		Perpetrator	-2.81	2.33	-.15
		Physical violence	-2.06	1.90	-.13
		Threat with a weapon	7.55	2.70	.35**
		Report to police	-1.46	1.91	-.09
		ΔR^2	.11***		
TSCC Anxiety	Step 1	Constant	29.18	6.04	
		Baseline score	0.37	0.11	.41**
		R^2	.17**		
	Step 2	Constant	34.11	6.39	
		Baseline score	0.32	0.11	.35**
		Perpetrator	-3.15	2.23	-.18
		Physical violence	-5.41	1.80	-.34**
		Threat with a weapon	3.12	2.60	.15
		Report to police	1.10	1.88	.07
		ΔR^2	.15**		
TSCC Posttraumatic stress	Step 1	Constant	31.11	8.18	
		Baseline score	0.32	0.14	.29**
		R^2	.09**		
	Step 2	Constant	33.90	8.76	
		Baseline score	0.29	0.14	.26**
		Perpetrator	-3.79	2.40	-.217
		Physical violence	-2.45	1.96	-.16
		Threat with a weapon	6.24	2.82	.30**
		Report to police	0.60	2.03	.04
		ΔR^2	.10**		

* $p < .10$, ** $p < .05$, *** $p < .001$.

Children's Responses to Trauma Inventory

As shown in Table 3, the baseline scores on the Total DSM, Intrusion, Avoidance and Arousal scales did not predict treatment outcome. None of the trauma related variables were predictive for the treatment outcome.

Table 3
Results of the hierarchical multiple regression analysis. Dependent variable: post-treatment score of the CRTI subscales. *N*= 39

			B	SE B	β
CRTI Total DSM	Step 1	Constant	38.45	14.95	
		Baseline score	0.07	0.25	.05
	R^2	.002			
	Step 2	Constant	47.93	17.08	
		Baseline score	-0.05	0.27	-.03
		Perpetrator	-8.48	6.07	-.26
		Physical violence	1.11	5.30	.04
Threat with a weapon		5.12	8.67	.01	
ΔR^2	.06				
CRTI Intrusion	Step 1	Constant	10.05	3.99	
		Baseline score	0.10	0.22	.08
	R^2	.01			
	Step 2	Constant	11.56	4.44	
		Baseline score	0.06	0.24	.04
		Perpetrator	-2.01	2.14	-.18
		Physical violence	-0.03	1.89	-.00
Threat with a weapon		1.14	3.09	.07	
ΔR^2	.03				
CRTI Avoidance	Step 1	Constant	11.45	5.42	
		Baseline score	0.24	0.22	.18
	R^2	.03			
	Step 2	Constant	14.25	6.77	
		Baseline score	0.16	0.25	.12
		Perpetrator	-3.42	2.29	-.27
		Physical violence	-0.33	2.05	-.03
Threat with a weapon		0.77	3.38	.04	
ΔR^2	.07				
CRTI Arousal	Step 1	Constant	13.86	3.39	
		Baseline score	-0.02	0.19	-.02
	R^2	.00			
	Step 2	Constant	15.88	3.66	
Baseline score		-0.10	0.20	-.09	
		Perpetrator	-2.86	2.00	-.26

Table 3 continued

	Physical violence	1.17	1.78	.11
	Threat with a weapon	3.73	2.92	.23
	Report to police	-1.40	1.74	-.14
	ΔR^2			.09

* $p < .10$, ** $p < .05$, *** $p < .001$.

Youth Self-Report for ages 11-18

As shown in Table 4, the baseline score on the Internalizing problems scale accounted for 21% of the variance in post-treatment score of the Internalizing problems scale, $F(1,57) = 14.68$, $p < .001$. In step 2, perpetrator, physical violence, threat with a weapon and report to the police added significantly to the model, accounting for an additional 9% of the variance, $F(5,53) = 4.51$, $p < .05$. The baseline score on the Internalizing problems subscale was significantly predictive for treatment outcome. More internalizing problems at pre-treatment were a sign of relatively more internalizing problems at post-treatment. Several trauma related variables were marginal significant predictors of treatment outcome. Threat with a weapon was a marginal significant predictor of treatment outcome on the Internalizing problems subscale. Girls who experienced threat with a weapon during the assault had relatively higher scores on internalizing problems at post-treatment. Physical violence was a marginal significant predictor of treatment outcome on the Internalizing problems scale, with the experience of physical violence during the trauma predicting relatively less symptoms at post-treatment.

The baseline score on the Externalizing problems scale accounted for 37% of the variance in post-treatment score of the Externalizing problems scale, $F(1,57) = 33.34$, $p < .001$. Step 2, added significantly to the model, accounting for an additional 6% of the variance, $F(5,53) = 7.85$, $p < .001$. The baseline score on the Externalizing problems subscale was significantly predictive for treatment outcome. More reported externalizing problems before treatment predicted relatively more externalizing problems at post-treatment. No trauma related variables were found to significantly predict the treatment outcome.

The baseline score on the Total emotional and behavior problems scale accounted for 20% of the variance in post-treatment score of the Total problems scale, $F(1,57) =$

14.28, $p < .001$. Step 2 added significantly to the model, accounting for an additional 10% of the variance, $F(5,53) = 4.44, p < .05$. The baseline score on the Total problems subscale was significantly predictive for treatment outcome. More emotional and behavioral problems in total at pre-treatment was a sign of relatively more emotional and behavioral problems at post-treatment. Again, several trauma related variables were marginal significant predictors of treatment outcome. Threat with a weapon was a marginal significant predictor of treatment outcome on the Total problems subscale. Girls who experienced threat with a weapon during the trauma had relatively higher scores on total problems at post-treatment. Physical violence was a marginal significant predictor on treatment outcome on the Total problems scale, with experiencing physical violence during the trauma predicting significantly less problems at post-treatment compared to girls who did not experience physical violence.

Table 4
Results of the hierarchical multiple regression analysis. Dependent variable: post-treatment score of the YSR/11-18 subscales. $N = 59$

			B	SE B	β
YSR Internalizing	Step 1	Constant	21.29	9.17	
		Baseline score	0.55	0.14	.45***
	R^2	.21***			
	Step 2	Constant	27.58	9.69	
		Baseline score	0.48	0.15	.39**
		Perpetrator	-3.91	3.15	-.17
		Physical violence	-4.85	2.47	-.23*
		Threat with a weapon	6.65	3.61	.24*
		Report to police	0.06	2.56	.00
	ΔR^2	.09**			
YSR Externalizing	Step 1	Constant	16.48	6.48	
		Baseline score	0.67	0.12	.61***
	R^2	.37***			
	Step 2	Constant	16.96	6.67	
		Baseline score	0.67	0.12	.61***
		Perpetrator	-3.04	2.38	-.15
		Physical violence	-2.72	1.91	-.15
		Threat with a weapon	3.18	2.74	.14
		Report to police	2.25	1.95	.12
	ΔR^2	.06***			
YSR Total	Step 1	Constant	19.02	9.51	
		Baseline score	0.59	0.16	.45***
	R^2	.20***			

Table 4 continued

Step2	Constant	23.52	10.05	
	Baseline score	0.53	0.16	.40**
	Perpetrator	-3.88	2.81	-.19
	Physical violence	-3.91	2.18	-.21*
	Threat with a weapon	6.11	3.15	.25*
	Report to police	1.20	2.25	.06
	ΔR^2			.10**

* $p < .10$, ** $p < .05$, *** $p < .001$.

Discussion

The aim of the present study was to investigate the predictors of treatment outcome of cognitive behavior group therapy (STEPS) for adolescent girls after a single rape experience.

Significant improvements from pre-treatment to post-treatment were found with medium to large effect sizes. The girls reported significantly lower levels of trauma-related symptoms after the STEPS treatment, except for externalizing problems (YSR). Comparing the pre-treatment score with the normative data shows that the mean score of the Externalizing problems scale is already within the normal range (Achenbach & Rescorla, 2001). For that reason a significant decrease did not appear. A possible explanation is that patients with PTSD tend to internalize their problems instead of externalizing them (Alisic & Kleber, 2010). Also, girls in this study probably do not report high levels of externalizing problems since having a problem with aggressiveness is an exclusion criterion for the STEPS treatment.

Discussion of the hypotheses

Baseline score

The first hypothesis stating that a higher baseline score predicts a less positive treatment outcome was not supported. The results show that higher scores at baseline predict relatively higher scores at post-treatment on the TSCC and the YSR. The girls' levels of depression, anxiety and posttraumatic stress symptoms decrease from pre- to post-treatment, but these levels are still significantly higher at post-treatment compared to the levels of the girls who started with a lower baseline score. The finding that the pre-level of posttraumatic stress predicts the post-level of posttraumatic stress, is consistent with previous research that showed that more PTSD symptoms at pre-treatment, predicted more PTSD symptoms at post-treatment (Karatzias et al., 2007; van Minnen et al., 2002). This result was not found for any of the subscales of the CRTI, which measures PTSD specifically. This implicates that the levels of posttraumatic stress symptoms do not differ significantly at post-treatment between the girls with higher levels of symptoms at baseline and the girls with lower levels of symptoms at baseline. A

higher pre-level on the subscales Internalizing problems, Externalizing problems and Total problems of the YSR predicts relatively higher scores at post-treatment as well.

These results do not imply that the STEPS treatment is not appropriate for girls with higher pre-levels of trauma-related symptoms. The girls with higher baseline scores do benefit from treatment and show a reduction in trauma-related symptoms, but still report significantly higher levels of trauma-related symptoms after treatment compared to girls with a lower baseline score. It is possible that these girls need more treatment sessions than the eight sessions provided at this moment.

Perpetrator

Being raped by an unknown perpetrator is of no influence on the treatment outcome, contrary to the second hypothesis. It was expected to find influence of an unknown perpetrator on the anxiety symptoms (Koss, Dinero & Seibel, 1988). The results implicate that it does not matter for the treatment outcome whether the girls have been raped by a known or an unknown perpetrator. This finding is consistent with recent research (Davidsson et al, 2009). A possible explanation might be that the experience of rape itself is traumatizing irrespectively of the identity of the perpetrator.

Physical violence

Contrary to the third hypothesis, experiencing physical violence during the trauma was found to predict a better treatment outcome. The girls who experienced physical violence reported significantly less anxiety symptoms (TSCC) after treatment compared to girls who did not experience physical violence. This is striking, since physical violence was expected to predict a less positive treatment outcome. A possible explanation for this result on the anxiety measure may be that girls who experienced physical violence, did so because they actually fought back. According to Heidt and colleagues (2005) about half of the victims experience tonic immobility during the rape (Heidt, Marx & Forsyth, 2005). Tonic immobility is characterized by involuntary immobility, analgesia and relative unresponsiveness to external stimulation (Gallup, 1974). Even though the girls who fought back lost the fight, they still feel like they did everything they could to prevent the

rape. Because they know they are able to fight back in this kind of situations, they will experience less anxiety symptoms after the treatment.

There seems to be a same tendency of the effect of physical violence on the subscales internalizing problems and total emotional and behavioral problems of the YSR. The girls who experienced physical violence reported significantly less internalizing and total problems after treatment compared to girls who did not experience that. An explanation for a better treatment outcome on internalizing problems may be that girls who experienced physical violence feel like they did everything they could to prevent the rape, but to no avail. They will feel less guilty about their selves because at least they tried. Therefore they may ruminate less. The Internalizing problems subscale is related to the Total problems subscale, thus having less internalizing problems automatically decreases the total of emotional and behavioral problems.

These results are not consistent with previous literature, which found a less positive treatment outcome after the experience of physical violence (Hembree et al., 2004). No effect of physical violence was found however on the depression and posttraumatic stress subscales of the TSCC, on all three the subscales of the CRTI and on the subscale externalizing problems of the YSR.

Threat with a weapon

The fourth hypothesis stating that being threatened with a weapon during the trauma predicts a less positive treatment outcome, is supported. Being threatened with a weapon was found to significantly predict a less successful treatment outcome score on the subscales Depression and Posttraumatic stress of the TSCC. This implicates that girls who experienced the threat with a weapon during the trauma, will benefit less from the treatment for their depression and posttraumatic stress symptoms. An explanation might be that the girls experienced an actual life threat, therefore their posttraumatic stress symptoms as well as their depression symptoms might have been higher at baseline (Basoglu et al., 2005; Boudreaux, Kilpatrick, Resnick, Best & Saunders, 1998). A similar tendency was found for threat with a weapon on the subscales Internalizing problems and Total problems of the YSR. Thus, experiencing the threat with a weapon predicts a less positive treatment outcome on these subscales as well. The subscale Internalizing

problems consists of the difficulties of withdrawn/depressed, somatic complaints and anxious/depressed (Achenbach & Rescorla, 2001). Since these problems include depression symptoms, it is not surprising that girls who experienced a threat with a weapon have higher scores on this subscale and therefore benefit less from treatment. Experiencing more internalizing problems automatically increases the levels of emotional and behavioral problems (Total problems). Being threatened with a weapon was not found significant on the remaining subscales of the TSCC and the YSR, as well as the CRTI.

Report to the police

The last hypothesis stating that reporting the case to the police predicts a less positive treatment outcome was found of no influence on treatment outcome. Reporting the case to the police or not doing so, does not predict any of the three outcome measures. This finding is in contrast with previous research (Davidsson et al., 2009). An explanation might be that this is a Swedish study conducted in Sweden. The method of working with raped girls might not be the same in the two countries and is therefore difficult to compare. The Psychotrauma Center cooperates with the local police department, where many of the girls reported their case. They are trained in working with rape victims, so they know how to support them in a proper way. As a consequence, the girls will not experience negative feelings by reporting their case, so it will not influence their treatment outcome.

Strengths and limitations

To our knowledge, this was the first study to investigate the predictors of treatment outcome in raped adolescent girls, who received a cognitive behavior group therapy (STEPS). This study started off investigating what pre-treatment levels and trauma-related characteristics are of influence on the success of the therapy. Knowledge about what predicts treatment response is of clinical importance.

Several questionnaires were used in this study to establish the trauma-related symptoms. The reliability and validity of these questionnaires are reported to be

satisfactory to excellent. Because of these psychometric qualities it is possible to make valid conclusions about the outcome measures.

A serious limitation of this study is the absence of a control condition in the form of a waiting list or a treatment control group. This would have been useful for establishing the effectiveness of treatment. Without a control group, it is not certain whether the improvements are solely from the treatment itself or perhaps due to other causes. However, Bicanic and colleagues (submitted) found that the decline of symptoms due to time can be ruled out. Because of ethical reasons a waiting list group was not included in this study. The Psychotrauma Center does not want to withhold immediate treatment from the girls who have the courage to look for help. Also, the possibility for the girls to make their own choice regarding the type of treatment (individual STEPS, group STEPS or EMDR) is highly valued. For that reason, no treatment control group is added to this study.

The results of this study are based on a highly specific sample of adolescent girls who have experienced a single rape. Only the girls who met the inclusion criteria participated in the STEPS group therapy. Furthermore, the girls in this study sought help voluntarily which is not a common tendency (Amstadter, McCauley, Ruggiero, Resnick & Kilpatrick, 2008). Generalization of these findings to the entire population of adolescent female rape victims is therefore questionable.

This study is subject to the limitations that are associated with self-report measures such as social desirability, recency effect, perceived consequences of openness as well as several patient characteristics including memory, language, health beliefs, culture and mental health (Stone et al., 2009). The use of clinician-administered interviews such as the ADIS-C (Silverman & Albano, 1996; Dutch version by Siebelink & Treffers, 2001) might be helpful in obtaining more accurate information.

Future research

For future research it is suggested to repeat this study with the addition of a control group in order to establish the efficacy of STEPS and to rule out other explanations for the decline in trauma-related symptoms at post-treatment. Because of

ethical reasons a waiting list control group cannot be included. A group following another intervention could be added as a control-group.

In additional investigation of the predictors of STEPS treatment, the ADIS-C (Silverman & Albano, 1996; Dutch version by Siebelink & Treffers, 2001) should be added as a possible predictor for PTSD. The original version of this clinician-administered interview is found to be reliable for determining pre-treatment PTSD (Lyneham, Abbott & Rapee, 2007). However, to add the ADIS-C, it has to be conducted in all participants, as was not the case in this study. Other questionnaires, that measure the same symptoms as already measured, could be included into the study as well, to investigate whether the predictors found are symptom-specific or, as it appears in the present study, measurement-specific. The six and twelve month follow-up should also be taken into account in a repetition of this study. This provides important information about whether the reported changes and the predictors of influence at post-treatment are sustained over time (Weiner, Schinka, Wayne, 2003).

Future research should investigate whether it is effective to provide more treatment sessions to girls with high levels of symptoms at pre-treatment. Recent research from Deblinger and colleagues demonstrated that eight and sixteen session of trauma-focused cognitive behavioral therapy for children were equally effective (Deblinger, Mannarino, Cohen, Runyon & Steer, 2011). However, their research group is difficult to compare to the group in the present study since their research group existed of sexually abused children between the age of 4 and 11, who showed high levels of externalizing problems. For that reason, future research should explore whether it is more effective for raped adolescents with high pre-treatment levels of trauma-related symptoms to receive more therapy sessions.

Implications for interventions

Since it is found that there is a significant mean reduction of trauma-related symptoms after the STEPS treatment, individual girls should not be excluded from this treatment based on the outcome predictors found in this study. The girls who are potentially at risk should be identified during the intake. The therapist has to monitor these girls during the treatment process to provide guidance and intervene if needed.

Communicating with the girl and her parents about the vulnerable situation is important because they can take this information into account during therapy.

Conclusion

This study showed that several trauma-related characteristics can be considered as predictors for treatment outcome. It was found that a higher baseline score predicts a higher post-treatment score for the depression, anxiety and posttraumatic stress symptoms, as well as the internalizing and externalizing problems and the total of emotional and behavioral problems. The experience of physical violence during the trauma predicts a better treatment outcome for anxiety and being threaten with a weapon predicts a less successful treatment outcome for depression and posttraumatic stress. A known or unknown perpetrator did not predict treatment outcome even as reporting the case to the police. Girls at risk should not be excluded from therapy since they generally benefit from treatment.

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