A Complex Multimodal 4-Week Residential Treatment Program Significantly Reduces PTSD Symptoms in Child Sexual Abuse Victims: The Be Brave Ranch

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Abstract

Childhood sexual abuse (CSA) occurs frequently and often has serious long-term sequelae including post-traumatic stress disorder (PTSD), which often leads to significantly worse outcomes among CSA survivors. However, the most effective treatment, particularly for younger children, remains uncertain. Research supports trauma-focused cognitive behavioural therapy (TF-CBT) in different age groups, and we designed a 4-week residential treatment program for CSA victims aged 8-12. Here we report the outcome from the first 35 children to take part in a complex multimodal program (mean age 10 years old), located at a dedicated facility (the "Be Brave Ranch"), with the primary therapeutic focus being TF-CBT, although several other treatment modalities were also utilized. Of the 35 children, 23 were female and 12 were male. The results show a highly significant (p<0.001) reduction in Child Post-Traumatic Stress Disorder Symptom Scale (CPSS) scores from baseline (20.5 ± 1.56) to follow-up (14.6 ± 1.55). Also, the number of children who were above the threshold for PTSD using this scale (a score of 16 or more) fell from 26 at baseline to 14 at the end of the 4-week intervention, suggesting that these improvements are also highly clinically relevant. There was also a significant (p<0.02) decrease in depression and anxiety, as measured by the Revised Child Anxiety and Depression Scale-Short Version scale, with scores decreasing from baseline (23.8 ± 1.77) to follow-up (20.6 ± 1.68). These results support the use of this short, but intense, residential intervention for CSA victims. They are also consistent with recent PTSD studies in adults demonstrating better efficacy for brief intensive interventions. Since reducing the number of CSA survivors who develop PTSD can have profound longer-term benefits, this suggests that such an approach might be more widely utilized. Further research should examine longer-term outcomes and effects of additional interventions, as well as comparisons to other therapies and determining if similar programs are useful in older age groups.

Keywords: Child; Sexual; Abuse; Residential; Therapy

Introduction

It is well recognized that child sexual abuse (CSA) occurs frequently in every geographical region, with a significant degree of sexual abuse occurring in approximately 1 in 6 girls and 1 in 12 boys (15% and 6% respectively) [1-6]. Unfortunately, it is difficult accurately determine the frequency of CSA, or if it is changing, as it is estimated that the vast majority is never reported [2,7]. There are multiple negative outcomes of experiencing CSA, many of which can be life-long [8-10]. In adults who have experienced CSA these include an increased risk of suicide attempts, and multiple other psychological, behavioural, sleep, and sexual issues [9-14]. Some of these outcomes are linked to inappropriate feelings of shame that these victims frequently feel [15-17]. Perhaps the most important of these psychological issues is the development of post-traumatic stress disorder (PTSD), since these symptoms are closely linked to poorer longer-term outcomes [18]. This occurs in approximately 40% of CSA survivors [19,20]. It is possible that these changes are mediated via neurobiological or cognitive developmental changes that occur following CSA [21-24].

In terms of treatment, several recent reviews have found a lack of well-designed studies for the treatment of PTSD following CSA, although the most successful appears to be trauma-focused cognitive behavioural therapy (TF-CBT) [7,25-27]. Other treatments have been tried, but have been generally found to be less effective and/or to have only limited amounts of published evidence supporting efficacy, including eye movement desensitization and reprocessing (EMDR), animal-assisted therapy, art-therapy, and play therapy [7,26-31]. Another issue when examining the efficacy of treatments has been the length of treatment and standardization of interventions, with most treatments being offered during weekly or biweekly meetings over a prolonged period [8,32,33]. These issues contribute to significant concerns being raised about access to appropriate therapies [34]. For these reasons current "standard" interventions, when available, are clearly problematic given the lack of evidence regarding effectiveness, standardization of intervention, and the most appropriate length of treatment.

One way of potentially addressing these issues is to provide a shorter-term, more intensive program, focused on improving PTSD symptoms. Recent adult studies have demonstrated that this approach is more effective than standard, longer-term, treatments [35,36]. For this reason we have developed a novel, intensive, residential program

to help children aged 8-12 who have been victims of CSA. This program was designed to be provided at a dedicated "camp-like" treatment facility called the "Be Brave Ranch", with additional therapeutic interventions for the following 1-year period [37]. The present publication examines evidence from the first group of children to enter into this program, to determine if the initial 4-week residential intervention improves PTSD symptoms, as measured by changes in CPSS scores.

Methods

All parents completed informed consent forms on behalf of their children prior to any activity in the program.

The program involves a 4-week initial attendance by the child at a residential facility (called the "Be Brave Ranch"), which was specifically designed for this [37]. It should be noted that the original plans anticipated a 3-week stay, but this was extended to 4-weeks during pilot work as it was difficult to complete all the therapy in such a compressed time. It is a "camp-like" facility, located in a semi-rural area in Alberta, Canada, on a dedicated 20-hectare site. There are a number of communal lodges designed to accommodate children. Parents were offered accommodation for periods throughout this stay, in nearby lodges located in the same facility. The exact length that parents stayed varied, but parents were strongly encouraged to visit their child on a regular basis and have daily telephone calls with their child every evening. There was a high staff ratio, and the facility has been designed to meet (and exceed) all required safety and regulatory guidelines. It is regularly assessed for compliance by appropriate authorities. The entire site is surrounded by a secured fence, and there are multiple other advanced security features designed to provide safety for the children.

During the program a comprehensive daily schedule was adhered to. The key therapeutic intervention revolved around the TF-CBT program, given during 40-hours of therapy during the 4-week residency period. To ensure consistency, an extremely detailed manual was used by all therapists, with daily and weekly meetings occurring to ensure consistency and fidelity to the program. The TF-CBT program involved the following components: (1) skills-building to enhance affective, behavioural, biological, and cognitive self-regulation; (2) gradual increasing exposure to the child's trauma in a carefully defined manner, with close support throughout; (3) development of a trauma narrative during which children described, and cognitively processed, their personal trauma experiences; and (4) treatment closure including conjoint caregiver–child sessions and safety planning. This detailed TF-CBT approach is based on much previously published work, and this approach has been shown to be beneficial to childhood victims of CSA over the longer-term [25]. It is also is consistent with a study in adolescent survivors of CSA which found a much better outcome with an approach that utilized repeated exposure to the trauma, when compared with supportive therapy alone. Approximately 2 hours per day were spent on group TF-CBT work.

In addition to the TF-CBT interventions, a variety of other activities were scheduled for the children. These were deliberately designed so that the program would be "fun" as well as "therapeutic". These activities included structured play, physical exercise, arts and crafts, music, cognitive-training, and interactions with animals. Each of these activities were also closely defined and manualized, and appropriately supervised. Approximately 6 hours each day were spent on these scheduled activities, with children having free time, preparation, and meal times as well for the remainder of each day. The manual included detailed clarification of specific games, art, and other activities carried out each day to help support the specific daily objectives of the TF-CBT program at that time. For example, after pilot work, it was determined that during the 4 week stay there would be 4 days in which there was therapeutic role playing, with the staff and children dressing up and spending the day in full costume playing therapeutically beneficial characters. Children were usually entered into the program in cohorts of 4 or 5 who would progress through the program at the same time, and share accommodation with their own room in a specific lodge. There was also approximately 2 hours of EMDR for each child every week. This program therefore represents a complex multimodal intervention, in which the primary therapeutic intervention was the TF-CBT, but the additional time spent in other activities was an important part of the overall therapeutic intervention.

Inclusion and Exclusion Criteria

Detailed inclusion and exclusion have been published previously [38]. In brief, inclusion criteria were for children aged 8-12 who had experienced childhood sexual abuse, were developmentally able to be in an on-site "camp-like" treatment facility, were able to perform skills of daily living for self-care, and were in stable physical health. All children had to be voluntary attendees, and specifically agree to attend the program in a 1:1 interview with a staff member (which could be carried out in person or via electronic means). They also had to have written parental / guardian support to attend. Exclusion criteria included current severe mental health or behavioural issues such as a recent suicide attempt, significant history of ongoing self-harm, significant ongoing addiction issues, or a history of violent behaviours towards others. Children who were considered a significant runaway risk were also excluded, despite a comprehensive level of security, as were those who had significant sexualized behaviour towards others.

Outcome measurements

The primary outcome measure we examined was is change in PTSD symptoms, as measured by the Child Post-Traumatic Stress Disorder Symptom Scale (CPSS), designed to be used in children aged 8 – 18, this scale has a total of 24 items and includes two parts; the first has 17-items and measures the type and frequency of PTSD symptoms (mapping directly on to DSM-IV criteria), each of which is can be scored on a scale of 0, 1, 2, and 3. The questions ask about how much each problem has bothered the individual during the previous 2 weeks. The CPSS can be thus be used as a continuous measure of symptom severity (summation of items 1–17 with possible scores ranging from 0 to 51). Several studies of the psychometric properties of the CPSS suggest that a score of 16 or more is highly likely to indicate clinically significant PTSD [39-41]. It also includes an additional second part which has 7 items, and measures the degree of functional impairment these symptoms cause, but in the program we did not utilize this second part. Improvements in PTSD symptoms would lead to a decrease in score.

As part of the program additional measurements were made to help determine if children experienced a change in mood and anxiety, self-esteem and quality of life, or experienced a perceived change in attachment. To measure mood and anxiety we utilized the Revised Children's Anxiety and Depression Scale (RCADS-Short Version) [42], a 25-item version of the initial 47-item version. For each item there was a possible score of 0-3 ('Never' = 0, 'Sometimes' = 1, 'Often = 2, 'Always' = 3), and possible scores could range from 0-75. This scale has

been previously used to measure depression and anxiety in youth [43,44]. Improvements in mood and anxiety would lead to a decrease in score.

To assess self-esteem and quality of life we used the Kid-KINDL [45], used previously to measure this in similar aged children [46-48]. This has 24 items, of which some are positively-framed questions while others are negatively-framed questions. We scored the positively-framed questions differently, as is the usual practice, so that a higher score indicates higher quality of life. Thus, for positively-framed questions 'Never' = 0, 'Seldom' = 1, 'Sometimes' = 2, 'Often = 3, and 'All the time' = 4, whereas for negatively-framed questions 'Never' = 4, 'Seldom' = 3, 'Sometimes' = 2, 'Often' = 1, and 'All the time' = 0. The range of possible scores was from 0-96. An increase in self-esteem and quality of life would lead to an increase in scores.

We wished to measure if children felt increased attachment and we therefore utilized 5 questions derived primarily from a questionnaire "Attachment Style Classification Questionnaire for Latency Age Children", used in studies with physically abused, neglected and maltreated children [49,50]. These questions were scored from 1-5 and were: 'I make friends with other children easily'; 'It is easy for me to depend on others, if they're good friends of mine'; 'It's all right with me if good friends trust and depend on me'; 'I usually believe that others who are close to me will not leave me'; 'Usually, when anyone tries to get too close to me it does not bother me'. Scores could range from 5-25. If attachment increased the score would increase.

All four of these scales were completed at baseline, either prior to coming to the treatment facility (whenever possible), or once they arrived. They were then repeated at Follow-up, within 48 hours of the end of the 4-week treatment program.

Children were also offered further longer-term supports and possible interactions for up to 12 months [37], but full details regarding outcomes from these are not currently available.

Sample size and statistical analysis

We carried out a sample size (power) analysis, to determine the appropriate size of the groups needed to provide likely statistically significant outcomes. Our primary outcome measure was the score on the CPSS scale, where a score of 16 or more indicates PTSD, and higher scores indicate greater levels of symptomology. A previous study utilized the CPSS scale as the primary outcome measure for sexually abused adolescent girls [34], and found that after a 3-month treatment period the mean scores on the CPSS scale decreased from 29.3 ± 2.65 (SD) to 16.2 ± 3.6 (SD). Prior to the program onset we assumed that the mean baseline score would be 24.0 with an SD of 6.0 and an SEM of 1.5, and we were aiming for a decrease in mean score to 12.0, with an SD of 6.0 and an SEM of 1.5 [38]. Using this information, with an $\alpha = 0.05$ and $\beta = 0.09$, we determined that we would need 16 individuals to meet statistical significance and demonstrate the effectiveness of the program.

The primary statistical method was a paired design, in which each child who completed both baseline ratings and follow-up ratings was their own control. Statistical analysis was carried out using paired Student's t-test, with $p<0.05$ as the a priori level of statistical significance. We report results as mean ± standard error of the mean (SEM).

Data handling and confidentiality

All data were collected in accordance with the Health Information Act of Alberta, and all other regulatory and legal requirements. A parent or legal guardian was required to consent on behalf of their children for all aspects of the program. To ensure that those who carried out any data analysis would have no identifiable information about the children involved, all electronic data was password protected. All participants were assigned a unique ID number to help protect the confidentiality of the data collected, and only the ID number was be made available to those carrying out the analysis.

This program adhered to all appropriate laws and regulations regarding confidentiality of data. However, it is important to note that while all information was confidential, there were two specific legal issues regarding confidentiality that were made clear to all participating children and their parents/guardians.

Child abuse: if a disclosure was made about abuse (physical, emotional, sexual, neglect) of a child, it was reported it to Alberta Child and Family Services and/or any other appropriate authorities.

Harm to self or others: if a disclosure was made about immediate or risk of self-harm, or harm to another client, staff would act appropriately including (as necessary) calling emergency services, the individual's family, or taking the child to a place of safety.

Results

A total of 35 children met the entry criteria and entered the program, and all completed the 28-day program. Of these children, 23 were female and 12 were male, with a mean age of 10.0 ± 0.5 years overall. The females (mean age 10.5 ± 0.4 years) were 1.5 years older than the boys (mean age 9.1 ± 0.3 years), which was significantly older ($p<0.01$, t = 2.99, df = 33). Baseline ratings were carried out a mean of 45.5 ± 5.5 days before the follow-up ratings, with 30 children completing Baseline ratings on all measures were completed prior to arriving to the treatment facility, in all except 5 children who completed Baseline ratings immediately upon arrival. All children completed follow-up ratings within 48 hours of completion of the treatment program.

Of the 35 children, all completed the residency program it is important to note that once trust had been established, several children made significant additional disclosures to BBR staff, all of which were reported to parents and law enforcement. While there were no significant episodes of self-harm (requiring any medical intervention), several children engaged in periodic self-harming behaviour including banging heads against walls, scratching/picking behaviour, squashing themselves into tights spaces etc. All such instances were treated as therapeutic opportunities and clinical staff worked with the children to teach them more appropriate coping strategies. Parental and/or guardian participation varied. In several instances children would travel from long distances, sometimes by airplane, in which case they were met at the airport and didn't usually have parental and/or guardian visits. Relatively few parents participated on a daily basis, either in person or on the telephone, but were continuously encouraged to do so.

In terms of CPSS scores, at Baseline the mean scores were 20.46 ± 1.56, with 26 of the children having scores of at least 16. At follow-up the mean scores were 14.60 ± 1.55, a highly statistically significant decrease ($p<0.001$, t = 4.03, df = 34). Additionally, of the original 26 children who had scores of 16 or more at Baseline, 12 (38%) had scores

of less than 16 at follow-up, suggesting that this reduction was not just statistically significant but was also clinical meaningful.

For anxiety and depression scores, at Baseline the mean scores were 23.83 ± 1.79, and at follow-up the mean scores were 20.57 ± 1.71, a statistically significant decrease ($p<0.02$, $t = 2.52$, $df = 34$).

In terms of Kid-KINDL scores there was a small, but not statistically significant, increase in mean scores from Baseline 63.86 ± 2.42 to follow-up 64.57 ± 2.46 ($p>0.05$). For the attachment questions there was a small, but not statistically significant, decrease in mean scores from Baseline 14.14 ± 0.54 to follow-up 13.34 ± 0.67 ($p>0.05$).

Discussion

The present results are very supportive that the clinical intervention program leads to a clinically meaningful improvement in symptoms of PTSD, as well as improvements in anxiety and mood symptoms. This would support suggestions that such an intensive approach could be more widely utilized. An advantage to children aged 8-12 of the current program is that it occurs in a residential facility, as many of them otherwise have no access to appropriate therapy (for geographical and other reasons). Given the fact that there is a lack of clinical treatment programs that demonstrate similar levels of improvement, at least in this age group of CSA survivors, this may be a valuable addition to the treatment options available.

However, the present program has some limitations. The first is that there is no comparison group. Ideally, it would be helpful to compare the daily TF-CBT program administered at the treatment facility with the same program administered on an out-patient basis. Unfortunately, this may be difficult to administer because of lack of access in many remote areas, but in urban settings it may be possible to carry out a suitable controlled study. A second potential limitation is that it is not possible to exclude any therapeutic benefits that derived from the "camp-like" environment and extra activities that this involved. It is conceivable that this may have contributed to the clinical improvements, but again research with an appropriate out-patient approach would help clarify this. In this regard, consideration should be given to a recent intensive outpatient intervention, which gave 14-21 hours of exposure therapy to adolescent female rape victims over 3 months, and which reported even greater reductions in CPSS scale scores [38]. Interestingly, this specific therapeutic intervention was much more effective than supportive counseling. This would suggest that the therapeutic intervention itself was the primary reason for the reduction in CPSS scores, and that non-specific interventions or activities are much less effective. Another potential limitation of the present research is that some potential confounding variables were not controlled for, including the degree of parental involvement, the nature of the sexual abuse, or if the offenders were parents, family members, or other individuals. Further research needs to also explore whether these positive findings are maintained over a 1-year period (to date only 5 individuals have completed a 1-year follow-up, there have been no drop outs, and their mean CPPS score has decreased from 25.6 at baseline to 13.0 at one year). However, further longer-term follow-up studies are required. Additionally, it would be useful to compare how this residential program compared to an out-patient program, although it should be recognized that many of the participants have no access to comprehensive care so this may be somewhat problematic to carry out. Finally, it would be very useful to determine if this program was effective for older ages (perhaps 13-16 year olds) and also if it was effective for different kinds of trauma.

It is also important to note that these outcomes represent the impact of a complex intervention. While the key therapeutic intervention was TF-CBT, the potential role of the other activities cannot be discounted. Indeed, they were chosen as there is some evidence for each activity to support a potential therapeutic benefit in children who have experienced CSA. We have reviewed these in detail [7], but in brief there is some evidence supporting the use of play therapy [28,51-53], art therapy [30], and EMDR [54,55] as specific treatment modalities. Therefore, the use of these supporting methods makes it difficult to ascribe the positive outcomes reported in the current study simply to the TF-CBT. This emphasizes the need for further research as previously described.

In conclusion, the present paper presents results from a novel complex multimodal residential program specifically designed to reduce PTSD symptoms in child survivors of sexual abuse. Unusually it is designed for those aged 8-12, which is often prior to the onset of many self-destructive behaviours, such as self-harm and addiction issues. The availability of a program with demonstrated improvements that are clinically meaningful is a useful treatment addition, and ideally it should be implemented more widely. Further research is needed to confirm its longer-term success, how it compares to similar out-patient programs, and to determine if it is also effective for children subject to other types of abuse and of different age groups.

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